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of Engineers**

Southwestern Division

Reservoir Control Center

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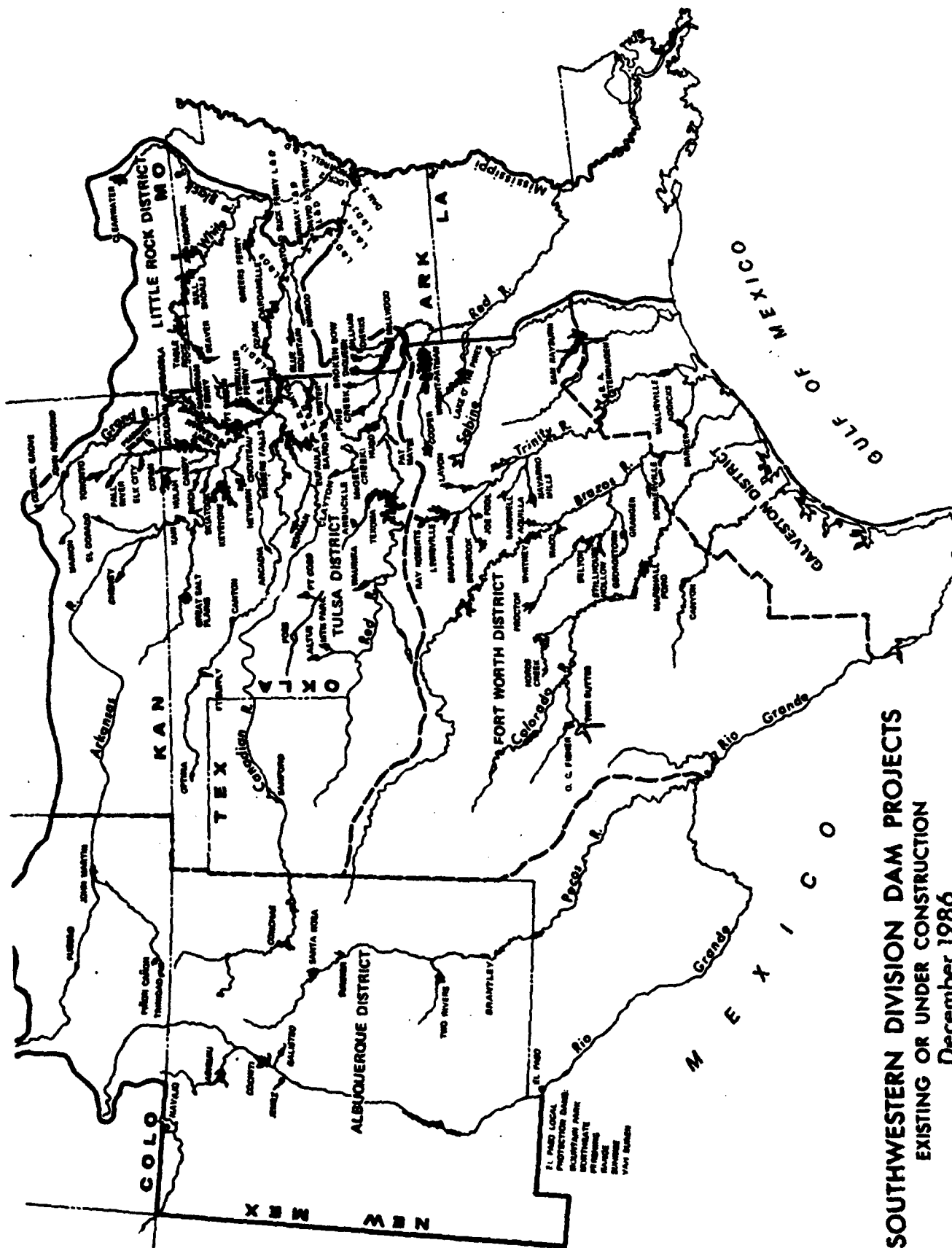
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**SOUTHWESTERN DIVISION DAM PROJECTS
EXISTING OR UNDER CONSTRUCTION
December 1986**

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report presents activities and accomplishments of the Southwestern Division (SWD) as related to reservoir regulation and water management activities for fiscal year 1988. Also presents detailed summaries of reservoir conditions, water quality activities, and coordinating activities with other Federal and non-Federal basin interests groups. Keywords: Army Corps of Engineers, Texas; New Mexico; Louisiana;		

1988

ANNUAL REPORT

RESERVOIR CONTROL CENTER

SOUTHWESTERN DIVISION



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PLATE

Dams and Reservoirs in the Southwestern Division

Inside Front Cover

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RESERVOIR CONTROL CENTER

1988 ANNUAL REPORT

SECTION I - INTRODUCTION

SECTION I - INTRODUCTION

1. PURPOSE OF REPORT. This report presents activities and accomplishments of the Southwestern Division (SWD) as related to reservoir regulation and water management activities throughout FY 1988. Detailed summaries of reservoir conditions, water quality activities, minutes of coordinating committee meetings and minutes of the 1988 Annual Reservoir Control Center meeting are also included.

This report is prepared in conformance with ER 1110-2-1400. 24 April 1970, Reservoir Control Centers, paragraph 12c.

2. REFERENCE. Reservoir Control Center (RCC) - SWD Guidance Memorandum, dated June 1971, approved by the Chief of Engineers as a general basis for the RCC's activities.

3. OBJECTIVES OF THE RESERVOIR CONTROL CENTER. The SWD RCC was established in 1967 by the Chief of Engineers to improve capabilities of the Corps of Engineers to perform its civil works mission as related to operation of reservoirs. The SWD RCC carries out its responsibilities by:

a. Organizing coordinating committees and/or participating in committees to accomplish mutual understanding among water interests regarding use and regulation of water resources.

b. Providing interbasin coordination of day-to-day regulation needs for river systems for all purposes.

c. Surveillance of daily operations and continuous analysis of Project needs.

d. Furnishing technical assistance to personnel of District offices in related efforts to improve the reliability of regulations and hydrologic determinations.

e. Provide management and technical guidance for the development and operation of the Division-wide dedicated water control data system. This system includes the equipment and software used for the acquisition, transmission and processing of real-time hydrologic and meteorological data for the purpose of regulating projects for which the Corps of Engineers has responsibility.

SECTION II - WATER CONTROL ACTIVITIES IN SWD

SECTION II - WATER CONTROL ACTIVITIES IN SWD

1. RESERVOIR REGULATION

a. Lake Regulation During FY 88. Lake regulation activities for Division lakes and Section 7 lakes during FY 88 are summarized in Section VI of this report. Operational data summaries for all of the SWD projects, including Section 7, are shown in tabular form, Section VII. An index, by basin, to these tables is included which also lists pertinent data for each project. Also included is a listing in alphabetical order giving names of both the lake and dam where different.

b. System Studies - FY 88

(1) Brazos River Super Model - Fort Worth District - Completed the final development of the Brazos River hydrology and system model. The period of record is January 1940 through December 1986. Simulations for natural and existing conditions were run to verify the hydrology and model.

(2) White River Super Model - Little Rock District Reservoir Regulation - Thirteen additional simulations were made for the Little Rock Reservoir Regulation section in their attempt to develop a regulation plan to enhance farming along the White River.

(3) White River Super Model - Little Rock District Planning - The White River hydrology was updated through 1986 and the natural and existing conditions were run to verify the hydrology. The Planning study is a navigation study on the White River system.

(4) Red River Super Model - Tulsa - Data for the Red River update was collected and verified during the latter months of this FY. This model will be used in the Texoma restudy.

(5) Trinity River Super Model - Fort Worth District - Data for the Trinity River update was collected and verified during the latter months of this FY. This model will be used for the Trinity river Regulation study.

(6) Arkansas River Feasibility Study - Tulsa and Little Rock Districts - The hydrology and Modified SUPER (computer) model for the Arkansas River Planning Model (contains eleven proposed reservoir sites) was completed in FY 88. The period of record is January 1940 through December 1986. Natural and existing condition runs were made to verify the hydrology and computer model. The economic portion of the model was also updated.

c. Water Control Manuals. A summary entitled "Status of Water Control Manuals in SWD" is included in Section IV of this report. The summary shows the status and completion schedule through FY 1991 for manuals and plans on 118 lakes and 17 river

systems and subsystems. Also shown in Section IV is a schedule for completion of high priority water control manuals for FY 89 thru FY 94. At the end of FY 1988, there were 97 Corps of Engineers projects (80 lakes and 17 locks and dams) and 19 Section 7 lakes in operation in SWD.

During FY 1988, the SWD Reservoir Control Center received and reviewed five water control manuals that were submitted by the Districts. The schedule for FY 1989 includes the development of four new manuals and the revision of four old manuals.

d. DROUGHT CONTINGENCY PLANS. A letter dated 8 June 1988 Subject; "Drought Contingency Plans (DCP)" renewed efforts within the Southwestern Division for the development of DCP's and provided additional guidance to supplement that contained in ER-1110-2-1941. This letter requested that DCP's be developed for all Corps projects with controlled reservoir storage and that the plans should only address temporary project modifications to satisfy short-term needs that can be implemented within existing authorities. During FY 88 several meetings were held in the SWD office with District personnel to develop a framework for DCP's, submittal schedules, review procedures, funding, etc. It was agreed that the DCP's would address individual projects. However, they would be developed on a river basin or sub-basin concept to include like projects. Each of the documented DCP's will become an appendix to the respective river basin Master Water Control Manual. A total of 23 DCP's will be developed for the river basins within the SWD. These plans were prioritized and scheduled for completion by FY 91. Table IV showing the river basin and projects within each basin is included in Section IV of this report. The table also shows a schedule for completion of the 23 DCP'S. During FY 88 initial drafts of the six first priority basin plans were submitted for review. In FY 89 11 initial drafts are scheduled for review and six in FY 90.

e. Section 7 Project Regulation. Within SWD there are 19 existing Section 7 reservoirs owned and operated by other agencies. The Bureau of Reclamation's Brantley Dam located on Pecos River began deliberate impoundment on 28 August 1988. The flood control storage contained in these projects are regulated by the Corps in accordance with Section 7 of the Flood Control Act of 1944. The Districts are continuing their efforts to bring the manuals and regulation plans into compliance with requirements contained in paragraph 208.11, Part 208 Flood Control Regulations, Chapter 11, Title 33 of the Code of Federal Regulations (41 FR 20401, May 18, 1976). Due to the varied approaches between the Districts on real time regulation for Section 7 projects, SWDO issued a policy letter on 21 March 1983. The purpose of the letter was to supersede previous SWDO guidance and to provide current policies on Section 7 projects. This letter and subsequent letters have been issued to the Districts requiring that policy on Section 7 projects be coordinated with project owners and that finalizing of water control manuals for existing projects should be expedited.

2. SOUTHWESTERN DIVISION WATER QUALITY PROGRAM AND ACTIVITIES.

a. Responsibilities. The Water Management Branch is assigned the responsibilities to coordinate and direct activities in SWD in the water quality field. This provides for water quality objectives being included as an effective part of our total water management program. Specific activities in the water quality program are as follows:

(1) Conduct technical studies and provide guidance on water quality control.

(2) Review and provide technical assistance in programs for predicting the natural and modified water quality in impoundments, rivers, coastal areas, and estuaries for project planning, design, and regulation activities.

(3) Review and provide technical assistance on project design and reservoir regulation studies in connection with water quality control performed within the Division, including multiple level outlet facilities, reservoir simulation studies, reregulation structures, and release reoxygenation systems.

(4) Provide coordination support in interagency liaison as related to water quality control through reservoir regulation, including formulation of operating plans and cooperative data collection programs.

(5) Coordinate with Planning and Construction-Operations Divisions, and the Districts on SWD water quality investigation programs.

(6) In coordination with the Geotechnical and Materials Branch, manage the water quality investigation activities of the Division laboratory.

(7) Responsible for technical engineering solutions to water quality problems in existing projects: reviewing, coordinating, and acting as consultants to other engineering and planning elements in the Division office and District offices.

(8) Coordination of Division actions required by ER 1130-2-334 for reporting of water quality management of Corps projects.

b. ORGANIZATION.

(1) Division. Water quality activities in SWD are coordinated within the Water Management Branch. These duties require the part-time efforts of two engineers in Water Management Branch, one biologist in Construction-Operations and a fisheries biologist in Planning Division. Mr. Charles Sullivan, Chief, RCC, is the SWD member on the HQUSACE Committee on Water Quality.

(2) Districts. The organizations for water quality management vary within the Districts. Water quality associated

with planning and design of the projects is coordinated by organizational elements within the Engineering or Planning Divisions in all of the districts. Monitoring and reporting specifically required by ER 1130-2-334 and that required for dredging and other construction activities are done by the Construction, Operations, Engineering or Planning Divisions in the various districts depending on their capabilities.

(3) Laboratory. The Division laboratory is staffed and equipped to conduct water quality testing required by the Districts for use in planning, design, construction, and operation of the projects. However, because of location, costs and other factors most water quality testing is contracted with private laboratories by the Districts.

c. Special Activities in FY 88.

(1) Specific Project Problems. Water Quality related problems and activities at individual projects are discussed in the District reports. Other items in this section are highlights of activities.

(2) Water Quality Management Reports. Water quality management reports were completed for one additional projects in FY 88. Water quality management reports are now available on 18 SWD projects. Most of these reports are for Fort Worth District projects.

(3) Baseline Data. Baseline data acquisition was initiated at one additional SWD reservoir project in FY 88. As of the end of the year base line data has been obtained at over 40 reservoirs. Our goal in this program is to develop a water quality data base for all SWD reservoir projects.

(4) Canyon Lake Non-Federal Hydropower Development. The Waterways Experiment Station (WES) selected Canyon Lake as a research field site for developing techniques to evaluate the impacts associated with installation of hydropower at Corps dams. An intensive water quality data collection program was initiated in the summer of 1988 to determine base (prior to power-on-line) conditions. The study will continue through the summer of 1989 to determine post (after power-on-line) conditions.

(5) Table Rock Dissolved Oxygen. WES physical and mathematical model studies have determined that retrofitting the structure with selective withdrawal facilities will not solve the dissolved oxygen problem. Little Rock District is awaiting the WES report before proceeding. Model results were discussed with Missouri State representatives in Sept. 1988.

(6) Abiquiu Lake Waste Material Problems. Several problems were encountered as the result of construction activities last year. Sediment and turbidity increased due to placement of spoil material downstream from Abiquiu Dam next to the Rio Chama channel. The spoil area is being cut back and vegetated to reduce

the erosion. Construction and office trash was found on the same spoil site. Albuquerque District removed the material and took two series of soil and water samples to alleviate concerns.

d. Long-Term Goals. The following are presently considered as long-term continuous goals of this Division, and consequently the Water Management Branch, in the water quality field.

(1) To obtain sufficient water quality information from all of our projects to determine whether all state standards and environmental objectives can be met without adverse impact on authorized uses.

(2) To promote the organization of effective water quality elements in the Division and Districts to obtain the maximum coordination for handling all water quality matters in the Division.

(3) To provide helpful and thorough guidance to the Districts on water quality matters.

e. Immediate Goals. The following actions have been scheduled for accomplishment in the near future:

(1) Continue the present intensive monitoring program for SWD reservoirs. This ongoing program will be continued until base line data are available for all SWD reservoirs.

(2) Review the basic water quality monitoring program.

3. SWD SEDIMENT PROGRAM AND ACTIVITIES. Sediment activities for the year included a field survey for one reservoir sedimentation resurvey. None of the sediment ranges along the McClellan-Kerr Arkansas River Navigation Project were resurveyed in FY88. Due to the funding priorities assigned to reservoir sedimentation resurveys, it's almost impossible to receive funding. Several water contracting entities have expressed an interest in obtaining resurveys to determine the depletion rates on their resource but we have been unable to obtain the necessary funding.

4. DATA COLLECTION AND MANAGEMENT.

a. Stream Gaging Program. The reporting and measurement of flow, water quality and sediment data are required for regulation, investigation and design of water resources projects. Most of these data are obtained through a Cooperative Stream Gaging program between the Corps and the U.S. Geological Survey (USGS). During FY 1988 the SWD-USGS cooperative program contained 445 surface water stations, 46 water quality stations, and 57 suspended sediment stations. An additional 66 stations were operated independently by the District Corps offices. In FY 88, the total cost of the SWD program was \$3.0 million with \$2.4 million being transferred to the USGS. The following tabulation shows a breakdown of the program by class of funds used to finance the program.

Class of Funds	C of E Cost \$1,000)
Survey Investigation	20
General Coverage	56
Planning	0
Operation & Maintenance	2,403
New Work & Construction	88
TOTAL:	2,487

b. Cooperative Reporting Networks. The National Weather Service (NWS) and the Corps of Engineers began their 51st year of cooperation in establishing and operating networks of river and/or rainfall reporting stations. Reports from these stations supplement those stations that are maintained by the NWS which are made available to the Corps of Engineers for flood control operations and flood forecasting. Data from these networks are transmitted to the Corps of Engineers District and Division offices via telephone and computer interface from the NWS collection office. A direct interface between the NWS S/140 computers located in the Fort Worth, Texas and Tulsa, Oklahoma NWS River Forecast Centers and the Corps Water Control Data System (WCDS) Harris carries hydrological reports, and other data essential to our water control management functions. These data include detailed precipitation reports, river stage information, warnings, descriptions of severe storms and floods, and river forecasts developed by the NWS. SWDO has obtained a small computer which dial NWS radar sites for current radar images which can be stored for later viewing.

The estimated FY 1988 cost for SWD responsibilities in supporting 482 rainfall stations in the NWS Cooperative Reporting Networks was \$246,939.

c. Water Control Data System. The "Water Control Data System Master Plan" for SWD, dated April 1979 was approved by the Office, Chief of Engineers in June 1979 for funding and detailed design. A "Water Control Data System Software Manual," dated February 1983 was developed as the system software design document.

(1) Communication. The Data Collection Platforms DCP's transmit the remote gaging station data over the Geostationary Orbiting Environmental Satellite (GOES) System. Communication between the District and Division data processing units is via the Division wide data communications network. A ground Receive Station (GRS) is located at Fort Worth, Texas, for receipt of the GOES transmission. The SWD system was installed at the Federal Center in Fort Worth, Texas, in September 1983. This is a Synergetics Model 10C direct Readout Ground Receive Station equipped with 2 antennas (one for GOES east and one for GOES west). Both dial-up and direct line access is provided between the GRS and the WCDS computers. Transfer of National Weather

Service (NWS) Automated Field Office Service (AFOS) data between the Corps and National Weather Service River Forecast Center computers is on a continuous basis via direct lines.

(2) Data Acquisition and Analysis. In June 1982, the RCC began using the Water Control Data System (Harris Computer) located in the Southwestern Division office, for computations that are necessary in the RCC's daily water control activities. Harris minicomputers were installed in the SWDO, Tulsa District, Fort Worth District, and Little Rock District offices as a part of the division wide Water Control Data System. The Albuquerque and Galveston Districts operate remotely from the computer located in SWDO. During FY 85 (as part of a Corps wide procurement contract) the original H-100 and H-500 computers were replaced by Harris 1000 computers at each of the four sites. The hardware at each site is compatible in order to allow the use of common software and data exchange between offices. A division wide data base is maintained on the SWDO machine and the other sites maintain a data base applicable to the site. The data bases at each District office are available to the Division office. The current data base uses the "TOTAL" data base management system and the SHEF code for data exchange with the National Weather Service. During FY 88 work continued on software development for analysis and display of the data.

(3) Data Display and Distribution. Data is displayed in individual offices with color graphic CRT's, PC's, plotters, and printers. Graphic applications programs utilize "TEMPLATE" Software which is licensed by Megatek Corporation. Provisions are made to exchange data with other water management cooperators. Examples of cooperative data exchange requirements are the Office of Chief Engineers, Lower Mississippi Valley Division (LMVD), National Weather Service, Southwestern Power Administration (SWPA), state and local river authorities or agencies. During the past year several routines were developed for the display of information in a graphical format. There also have been several routines developed for display of current project data and reports.

d. Cooperative Data Base and Forecasting Activity. The RCC continues to participate in and encourage the advancement of programs for automated data collection and interagency cooperation in forecasting activity and data base utilization. Currently, SWD maintains a data base on the WCDS for Daily Generation reports, and daily River Reports. These data bases are updated daily and the data are maintained until the end of the month then used for monthly summaries. These data, with several District auxiliary programs and data bases, have been used to make forecasts and reports available for exchange as needed between the Districts and SWDO. In addition, the data are made available to other users which have a need to be aware of the water control activities. Several users have participated in using the USGS WATSTORE data bank for storing and retrieving data.

e. Continuity of Operations Plan (COOP). During the past

year a draft COOP for the Southwestern Division Water Control Data System has been developed. This plan outlines procedures for providing back up capability in the event of a equipment failure at any one site in the SWD WCDS. Plans are to test and finalize the COOP during FY 89.

5. COORDINATION WITH WATER MANAGEMENT INTERESTS.

a. General. The benefits deriving from personal contact with other persons associated with water management activities are well recognized by the RCC. For this reason, special emphasis has been placed on maintaining this personal contact through meetings and workshops sponsored by the Districts and the RCC with the marketing agency, project personnel, river basin authorities, other Divisions, the Chief's office and others.

(1) The Hydrologic Engineering Section and the Hydraulics Section (other sections in the Water Management Branch) furnish support to the RCC. The Hydrologic Engineering Section conducts systems studies of Reservoir Regulation and the Hydraulics Section reviews studies on sediment and water quality activities.

(2) A meeting of lake regulation personnel of each of the Districts and the RCC is held annually at the Division Reservoir Control Center for the purpose of discussing timely topics and exchanging information. Periodically the Hydrologic Engineering and the Hydraulics Sections will hold joint meetings with the RCC. The minutes of the 16 and 17 November 1988 meeting are included in Section VIII.

b. Agency Coordination.

(1) Arkansas River Basin Coordinating Committee. After being inactive since the 30 April 1982 meeting in Little Rock, Arkansas the committee was reestablished in connection with the notification of adoption of the "1986 Arkansas River Water Control System Operation Plan." The notification for the plan was issued on 17 June 1986 with the plan becoming effective on 1 July 1986. The second meeting of the reestablished committee was held in Dallas on 6 June 1988. At this meeting it was agreed to hold another meeting in the Spring of 1989. The minutes of the meeting are included in section VIII.

MEETINGS OF THE REESTABLISHED ARKANSAS COORDINATING COMMITTEE

Meeting	Date
1	28 Jan 1987
2	6 Jun 1988

(2) Cooperation with Lower Mississippi Valley Division.
The SWD RCC continues its cooperation with LMVD and provides

observed, as well as forecasted data, that are significant to the water management activities in LMVD.

(3) Cooperation with Southwestern Power Administration.

The SWPA is an agency of the United States, established in the Department of Energy, to execute the purposes of the Flood Control Act of 1944 with respect to the disposition of the electric power and energy made available from the reservoir projects under control of the Department of the Army in the area comprising all of Arkansas and Louisiana and portions of Missouri, Kansas, Texas, and Oklahoma. The scheduling of releases for hydropower production from the 17 Corps of Engineers projects within SWD has a significant effect on the overall water management activities in the Division. Therefore, close cooperation and continuous communication between the Corps and SWPA are mandatory. A Memorandum of Understanding was signed by the SWPA and the Corps of Engineers in 1980. SWPA and SWD have proceeded to develop a draft detail Operating Arrangement to assist in the operations of hydropower projects within SWD. SWD has formally informed the SWPA that the draft document would be its policy for coordinating operations with them until such time that both agencies have signed the arrangement. Specific activities included in the Operating Arrangement for cooperation between SWPA and RCC are monthly scheduling of power production, preparation of data for reports to the Federal Energy Regulatory Commission (FERC), and daily coordination of routine data on current conditions, inflow forecasts, and release schedules. The RCC has taken every opportunity to improve and strengthen relations with SWPA through correspondence, regularly scheduled and special meetings, providing access to our time-share systems, and by special studies aimed at improving energy production and scheduling at SWD power projects.

(4) National Weather Service. A NWS Interagency Support Agreement was signed by General Lee on 17 July 1988 for hydrometeorological services for the Southwestern Division. The agreement provides that a full time NWS employee will be assigned to the Reservoir Control Center. NWS expects to fill this position by January 1989. Also, during the past year, meetings between the Corps and NWS were held to refine procedures for computer to computer exchange of hydrometeorological data. Meetings were also held to improve coordinated snow runoff forecasts. AFOS products are being furnished from the NWS S/140 computers to the CE H-1000 computers on a continuous basis via direct line between these machines. The Ft. Worth NWS in cooperation with SWD and HEC developed software which allows the transmission of the AFOS Graphics products to the Corps through the VUENWS Program. Efforts are continuing to develop the software required to allow the direct transmission of CE products to the NWS AFOS system. This would also be by the direct line link between the NWS and CE computers.

(5) General Accounting Office (GAO). The SWD RCC has continued to cooperate with GAO in their investigation of the

forecasting and regulation activities which were associated with the October 1986 flood in Oklahoma. This review was initiated during the latter stages of the flood event and has continued through the current FY. We have furnished GAO documentation on project plans of regulations, weather data, stream flow data, lake data, etc., which was available during the flood. The assembly of this information has involved numerous man-hours of effort during 1987-88. GAO completed an interim report in 1987 and a final report was made in 1988. In general, the reports supported SWD operation of the Arkansas River Basin Project during the Oct 1986 flood. However, a legal opinion provided by GAO Counsel, questioned the Corps' authority to operate those projects in the Arkansas Basin for the benefit of navigation if the project had not specifically been authorized for navigation. Corps Counsel reviewed this finding by GAO, and supported SWD authority to use projects in the Arkansas Basin to support navigation.

Section III - FACILITIES AND PERSONNEL

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1. Facilities.

a. Office Space. SWDO personnel occupies quarters on the third floor in the Sante Fe Building, 1114 Commerce Street, Dallas, Texas. Space occupied by the RCC includes an open-space working area, and an equipment room.

b. Display Facilities. All of the display equipment used for conferences and for briefings of higher authorities are located in the Engineering Division conference room. This room has limited space and equipment; but, it does include chalkboards, white metal panel adequate for use of markers, portable projection equipment, a projection screen, and a large screen display unit driven by an IBM-XT.

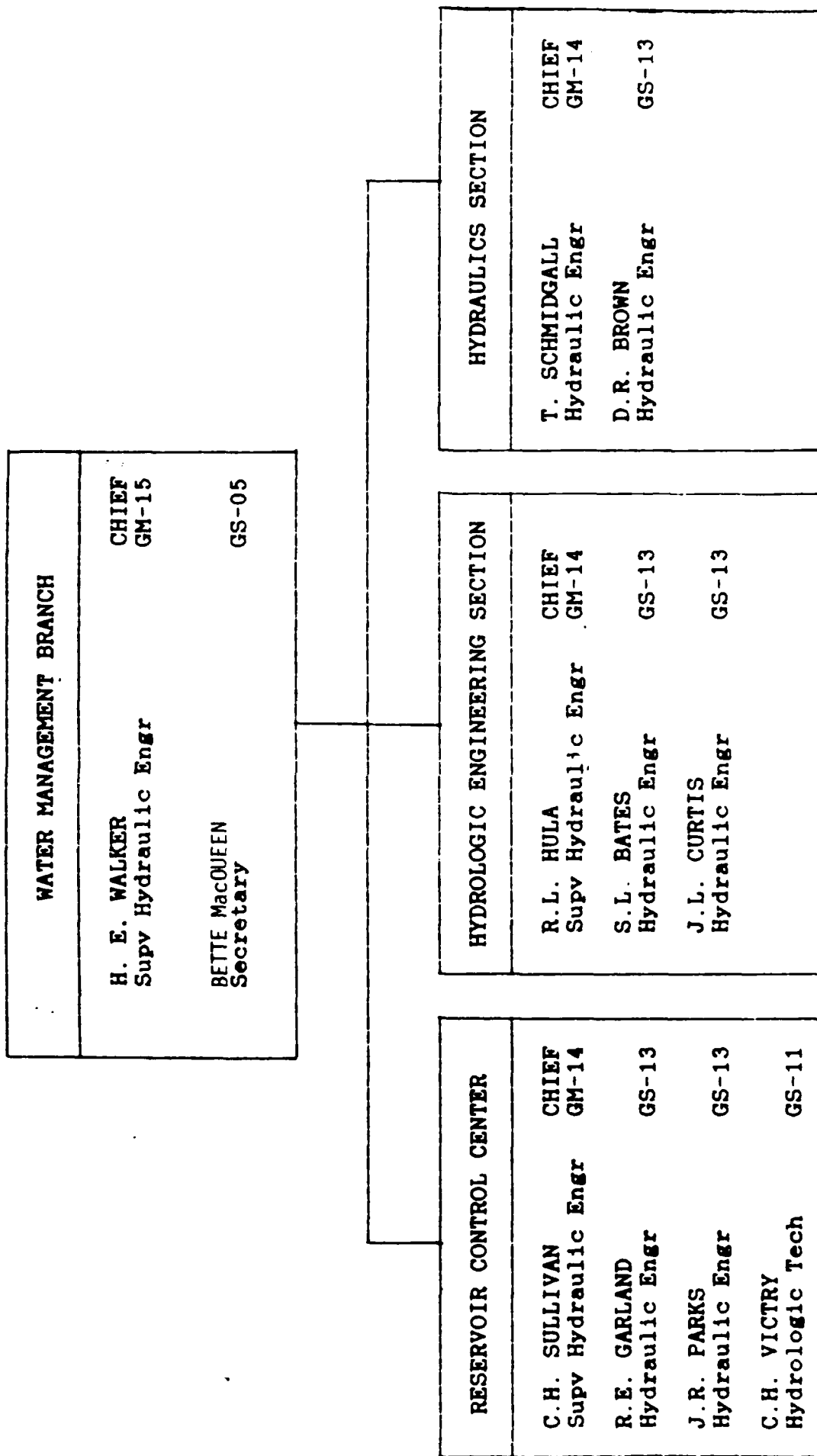
c. Communications Equipment. The equipment room contains a multiplexor, two dot-matrix hard-copy TTY terminals, one letter quality terminal, a tektronix color graphics terminal with plotter, printer and digitizing tablet, IBM-AT and printer, IBM-XT which is used to drive the large screen display, Sony color monitor with VTR and an Alden Color Radar system. The Sony color monitor is used to monitor and record weather and news events on the Cable News Network, Weather Channel, and local TV stations. The Alden Color Radar system is used to monitor and record radar images from National Weather Service radars within SWD and along the Gulf Coast.

2. Personnel.

a. Staff. The authorized staff of the RCC consists of one supervisory hydraulic engineer, two hydraulic engineers and one hydrologic technician. The RCC is supported in technical studies by the Hydrologic Engineering and the Hydraulics Sections. The current organization chart for the SWD Water Management Branch is shown in figure 1.

b. Training. The RCC periodically assesses the training needs of its personnel and schedules that training which is required and possible. Training for the past year included a System Analyst course for the Harris H-1000 Water-Mini.

FIGURE 1



SECTION IV
STATUS OF RESERVOIR WATER CONTROL MANUALS
AND DROUGHT CONTINGENCY PLANS

STATUS OF WATER CONTROL MANUALS IN SMD
(Report Control Symbol DAEN-CWE-16)
Revised: January 1989

RESERVOIR	STREAM	OWNER	DIST	APPROVED			SCHEDULED THRU F- 91	
WHITE RIV MASTER		CE	LRD	DEC 55	OCE	F	SEP 90	U
BEAVER	WHITE RIV BASIN	CE	LRD	JAN 67	OCE	F		
TABLE ROCK	WHITE RIV BASIN	CE	LRD	JAN 67	OCE	F		
BULL SHOALS	WHITE RIVER BASIN	CE	LRD	JAN 67	OCE	F		
NORFOLK	WHITE RIVER BASIN	CE	LRD	JAN 67	OCE	F		
CLEARWATER	BLACK RIVER	CE	LRD	FEB 73	SWD	R*		
GREENS FERRY	LITTLE RED RIVER	CE	LRD	JUN 66	OCE	F		
ARKANSAS MASTER		CE	AD	JUN 70	OCE	F		
PUEBLO (1)	ARKANSAS RIVER	BF	AD	JUN 84	SWD	F		
TRINIDAD	PURGATORIE RIVER	CE	AD	SEP 85	SWD	F		
JOHN MARTIN	ARKANSAS RIVER	CE	AD	JAN 83	SWD	AR		
ARKANSAS MASTER		CE	TD	OCT 80	SWD	F		
CHENEY (1)	N.F. MINNESOTA	BR	TD	MAR 86	OCE	AR		
EL TORADO	WALNUT RIVER	CE	TD	FEB 83	SWD	F		
KAW	ARKANSAS RIVER	CE	TD	JAN 78	SWD	F		
GREAT SALT PLAINS	SALT FORK RIV	CE	TD	AUG 71	SWD	F		
KEYSTONE	ARKANSAS RIVER	CE	TD	APR 65	OCE	F		
HEYBURN	FOLEGT CREEK	CE	TD	DEC 84	SWD	F		
VERMIGRIS SYSTEM								
TORONTO	VERMIGRIS RIVER	CE	TD	AUG 66	OCE	F	NOV 88	U
FALL RIVER	FALL RIVER	CE	TD	AUG 66	OCE	F		
ELY CITY	ELY RIVER	CE	TD	AUG 66	OCE	F		
PEARSON-SWEETIE-BIG HILL	BIG HILL CREEK	CE	TD	APR 83	SWD	F		
DOLOGAH	VERMIGRIS RIVER	CE	TD	JUL 76	SWD	F		
COPAN	CANEY RIVER	CE	TD	MAR 83	SWD	F		
MULAH	CANEY RIVER	CE	TD	JUN 69	OCE	AR		
BIRCH	BIRD CREEK	CE	TD	SEP 81	SWD	F		
SKIATOOK	HOMINY CREEK	CE	TD	DEC 84	SWD	F		
GRAND SYSTEM								
COUNCIL GROVE	NEOSHO RIVER	CE	TD	MAY 74	SWD	F		
MARION	COTTONWOOD RIVER	CE	TD	AUG 74	SWD	F		
JOHN REDMOND	NEOSHO RIVER	CE	TD					
PENSACOLA (1)	NEOSHO RIVER	GRDA	TD	MAR 65	OCE	AR		
MARSHAM FERRY (1)	NEOSHO RIVER	GRDA	TD	MAR 65	OCE	AR		
FORT GIBSON	NEOSHO RIVER	CE	TD	MAR 65	OCE	AR		
TENKILLER FERRY	ILLINOIS RIVER	CE	TD	MAR 77	SWD	F		

TABLE IV - 1

STATUS OF WATER CONTROL MANUALS IN SWD
(Report Control Symbol DAEN-CWE-16)
Revised: January 1985

RESERVOIR	STREAM	OWNER	DIST	APPROVED	SCHEDULED THRU FY 91
CANADIAN SYSTEM					
CONCHAS	CANADIAN RIVER	CE	AD	JAN 68	OCE F
SANFORD (1)	CANADIAN RIVER	BR	TD	FEB 66	OCE AR
NORMAN (1)	LITTLE RIVER	BR	TD	DEC 65	OCE F
OPTIMA	N. CANADIAN RIVER	CE	TD	JAN 72	SWD F
FORT SUPPLY	WOLF CREEK	CE	TD	JAN 72	SWD F
CANTON	N. CANADIAN RIVER	CE	TD	JAN 72	SWD F
ARCADIA	DEEP FORK RIVER	CE	TD	JUN 66	SWD F
EUFULA	CANADIAN RIVER	CE	TD	NOV 63	OCE F
NEWY GRAHAM PT. VI, L&D 13	ARKANSAS RIVER	CE	TD	AUG 72	SWD F
CHOUTEAU PT. VI, L&D 17	ARKANSAS RIVER	CE	TD	AUG 72	SWD F
NEEDERS FALLS PT. IV, L&D 16	ARKANSAS RIVER	CE	TD	JUN 72	SWD F
R.S. VERR PT. III, L&D 15	ARKANSAS RIVER	CE	TD	APR 72	SWD F
W.D. MAYO PT. II, L&D 14	ARKANSAS RIVER	CE	TD	FEB 72	SWD F
WISTER	POTEAU RIVER	CE	TD	JUN 74	SWD F
BLUE MOUNTAIN	PETIT JEAN	CE	LFD	MAR 68	OCE F
NIMROD	FOURCHE LA PAVE	CE	LFD	MAR 68	OCE F
LOCK & DAM 12	ARKANSAS RIVER	CE	LFD	SEP 74	SWD F
OLNEY-JETA TAYLOR	ARKANSAS RIVER	CE	LFD	SEP 74	SWD F
BARDONELLE	ARKANSAS RIVER	CE	LFD	APR 76	SWD F
LOCK & DAM 9	ARKANSAS RIVER	CE	LFD	APR 76	SWD F
LOCK & DAM 8 TOAD SUCK FERRY	ARKANSAS RIVER	CE	LFD	AUG 74	SWD F
LOCK & DAM 7 MURPHY	ARKANSAS RIVER	CE	LFD	AUG 74	SWD F
LOCK & DAM 6 DAVID G. TERRY	ARKANSAS RIVER	CE	LFD	SEP 74	SWD F
LOCK & DAM 5	ARKANSAS RIVER	CE	LFD	SEP 74	SWD F
LOCK & DAM 4	ARKANSAS RIVER	CE	LFD	SEP 74	SWD F
LOCK & DAM 3	ARKANSAS RIVER	CE	LFD	SEP 74	SWD F
LOCK & DAM 2	ARKANSAS RIVER	CE	LFD	SEP 74	SWD F
LOCK & DAM 1 (AS) POST CANAL	ARKANSAS RIVER	CE	LFD	SEP 74	SWD F
PED RIVER MASTER		CE	TD	FEB 63	OCE AR
ALTUS (1)	N. FORK RED	BR	TD	OCT 68	OCE F
MOUNTAIN PARK (1)	OTTER CREEK	BR	TD	MAR 76	SWD R+
TRUSCOTT BRINE LAKE	BLUFF CREEK	CE	TD		
LAKE YEMP (1)	WICHITA RIVER	MCID	TD	JUN 73	SWD F
MAURITA	BEAVER CREEK	CE	TD	APR 77	SWD F
FOSS (1)	WASHITA RIVER	BR	TD	MAY 61	OCE F
FORT COBB (1)	COBB CREEK	BR	TD	MAR 61	OCE F
ARRUCKLE (1)	ROCK CREEK	BR	TD	SEP 67	OCE AR
TEXOMA	RED RIVER	CE	TD	SEP 82	SWD F
PAT MAYSE	SANDERS CREEK	CE	TD	OCT 67	OCE F
SARDIS	JACKFORK CREEK	CE	TD	AUG 84	SWD F
MCGEE CREEK (1)	MUDDY BOBBY CREEK	BR	TD	MAY 87	SWD AP
HUGO	KIAMICHI RIVER	CE	TD	JUL 82	SWD AP

MAY 90 F

FEB 89 F

STATE OF WATER CONTROL MANUALS IN SWD
(Report Control Sybbs) DAEN-CWE-16
Revised: January 1989

RESERVOIR	STREAM	OWNER	DIST	APPROVED	SCHEDULED THRU FY 91
LITTLE RIV SYS					
FINE CREEK	LITTLE RIVER	CE	TD	JUL 74 SWD AR	
BROKEN BOW	MOUNTAIN FORK	CE	TD	NOV 74 SWD F	
DEQUEEN	POLLINS FORK	CE	LRO	JUN 76 SWD R	
GILLHAM	COSSATOT RIVER	CE	LRO	JUL 86 SWD F	
DIERKS	SALINE RIVER	CE	LRO	AUG 75 SWD F	
MILLWOOD	LITTLE RIVER	CE	LRO	NOV 73 SWD F	
SULPHUR RIV MASTER					
COOPER	SULPHUR RIVER	CE	FWD		SEP 89
WRIGHT PATMAN	SULPHUR RIVER	CE	FWD	NOV 74 LMVD F	OCT 89
LAKE OF THE PINES	CYPRESS CREEK	CE	FWD	NOV 74 LMVD F	
NECHES RIV MASTER					
B. A. STEINHAGEN	NECHES RIVER	CE	FWD	MAR 87 OCE AR	
SAM RAYBURN	ANGELINA RIVER	CE	FWD	FEB 83 OCE AR	
		CE	FWD	FEB 73 SWD AR	JAN 90
TRINITY RIV MASTER					
BENERGO	CLEAR FORK	CE	FWD	MAY 75 SWD F	JAN 89
JOE POOL	MOUNTAIN CREEK	CE	FWD	MAY 75 SWD F	
RAY ROBERTS	ELM FORK	CE	FWD	JAN 86 SWD F/AR	NOV 89
LEWISVILLE	ELM FORK	CE	FWD	JAN 86 SWD F/AR	AUG 89 F
GRAFEVINE	DENTON CREEK	CE	FWD	MAY 75 SWD F	JUL 90
LAVON	EAST FORK	CE	FWD	MAY 75 SWD F	APR 89
NAVAHRO MILLS	HIGHLAND CREEK	CE	FWD	MAY 75 SWD F	SEP 90
BARDWELL	WYAHACHE CREEK	CE	FWD	JUL 84 OCE AR	JUN 89 F
WALLISVILLE	TRINITY RIVER	CE	GO	JUL 85 OCE AR	FEB 89 F
BUFFALO BAYOU MASTER					
BARYER	BUFFALO BAYOU	CE	GO		
ADDICKS	BUFFALO BAYOU	CE	GO	OCT 72 SWD F	
		CE	GO	OCT 72 SWD F	
BRAZOS RIV MASTER					
WHITNEY	BRAZOS RIVER	CE	FWD	MAR 73 SWD R*	JUN 90 R
AGUILLA	AGUILLA CREEK	CE	FWD	MAY 75 SWD F	
PROCTOR	LEON RIVER	CE	FWD	JUL 88 SWD F	
BELTON	LEON RIVER	CE	FWD	APR 74 SWD F	
STILLHOUSE HOLLOW	LEON RIVER	CE	FWD	MAY 76 SWD F	
GEORGETOWN	LAMPASAS RIVER	CE	FWD	FEB 79 SWD F	
GRANGER	N.F. SAN GABRIEL	CE	FWD	FEB 79 SWD F	
WACO	SAN GABRIEL	CE	FWD	JUN 80 SWD P	NOV 88 R
SOMERVILLE	BOSQUE RIVER	CE	FWD	NOV 82 SWD R	DEC 88 R
	VEGUA CREEK	CE	FWD	AUG 73 SWD F	
		CE	FWD	NOV 73 SWD F	

STATUS OF WATER CONTROL MANUALS IN SWC
(Report Control Symbol DAEN-CWE-16)
Revised: January 1989

RESERVOIR	STREAM	OWNER	DIST	APPROVED			SCHEDULED THRU FY 91
COLORADO RIV MASTER		CE	FWD				
HORDS CREEK	HORDS CREEK	CE	FWD	MAY 82	OCE	AR	
O.C. FISHER	N. CONCHO	CE	FWD	DEC 82	OCE	AR	
TWIN BUTTES (1)	S. CONCHO	BR	FWD	SEP 86	OCE	P/FR	SEP 89
MARSHALL FORD (1)	COLORADO RIVER	BR	FWD	MAY 80	SWD	P/FR	JAN 91
GUADALUPE RIV MASTER		CE	FWD	JAN 86	OCE	AR	
CANYON	GUADALUPE RIVER	CE	FWD	MAY 73	SWD	F	
RIO GRANDE MASTER		CE	AD	FEB 87	OCE	F	
ARIZONA	RIO GRANDE	CE	AD	JUN 82	SWD	F	
COCHITI	RIO GRANDE	CE	AD	JUN 81	SWD	F	DEC 89 U
GALISTEO	GALISTEO CREEK	CE	AD	APR 88	OCE	F	
JEMEZ CANYON	JEMEZ RIVER	CE	AD	AUG 84	SWD	F	
PLATON (1)	CONCHOS RIVER	BR	AD	MAY 84	OCE	F	JAN 91 U
PECOS RIV MASTER		CE	AD	NOV 77	SWD	AR	
SANTA ROSA	PECOS RIVER	CE	AD	SEP 81	SWD	F	
SUNNER (1)	PECOS RIVER	BR	AD	JUL 84	SWD	AR	MAR 91 U
TWO RIVERS	RIO MONTE	CE	AD	JUN 84	OCE	F	
BRANTLEY (1)	PECOS RIVER	CE	AD				JUN 89
NAVADO (1)	SAN JUAN RIVER	BR	AD	JUN 70	OCE	F	SEP 90 U

NOTES:

- (1) = Section 7 project, flood control regulation by CE.
- AR = Approved, comments to be answered.
- F = Complete, comments have been answered and approved.
- FR = Published in Federal Register.
- P = Plan.
- R = Revision or answer to comments.
- R* = Returned without approval.
- U = Update of existing approved manual.
- GRDA = Grand River Dam Authority.
- WCID = Wichita County Water Improvement District.
- LCRA = Lower Colorado River Authority.
- BR = Bureau of Reclamation.

SOUTHWESTERN DIVISION
SCHEDULE OF HIGH PRIORITY WATER CONTROL MANUALS
FY 89 THRU FY 94

DISTRICT					
FY	ALBUQUERQUE	FORT WORTH	GALVESTON	LITTLE ROCK	TULSA
89	BRANTLEY	GRANGER			KEYSTONE
		GEORGETOWN			TORONTO
		MARSHALL FORD			MC GEE CREEK
		TWIN BUTTES			
90	NAVALJO	BARNWELL	ADDICKS	WHITE RIVER MAS	PENSACOLA
		NAVARRO MILLS	BARKER	L & D #13	
		GRAPEVINE			
		RAY ROBERTS			
		JOE POOL			
91	PLATONIA	TRINITY RIV MAS		L & D #7	HULAH
	SUMNER	BRAZOS RIV MAS			ALTUS
		BENBROOK			
		LEWISVILLE			
		LAVON			
92	RELIQUIU	WRIGHT PATMAN		CLEARWATER	KAW
	TRINIDAD	SAM RAYBURN			HUDSON
	TWO RIVERS	PROCTOR			FT GIBSON
	GALISTEO				FOSS
					ELK CITY
					EUFULA
					TOM STEED
93		LAKE O' PINES		BULL SHOALS	TEXOMA
		NECHES RIV MAS		TABLEROCK	DOLOGAH
		DAM B			
94		COLORADO MAS		GREER FERRY	RED RIVER MAS
					THUNDERBIRD
					GREAT SALT
					FALL RIVER

*Revised Feb 1 1989

Table IV-5

TABLE IV
STATUS OF DROUGHT CONTINGENCY PLANS IN SWD

JANUARY 1989

SCHEDULED COMPLETION DATE

STREAM

DIST

BASIN/PROJECT

WHITE RIV BASIN

BEAVER
TABLE ROCK
PULL SHOALS
MORFORK
CLEARWATER
GREENS FERRY

AUGUST 1989

LRD
LRD
LRD
LRD
LRD
LRD

WHITE RIVER
WHITE RIVER
WHITE RIVER
WHITE RIVER
BLACK RIVER
LITTLE RED RIVER

UPPER ARKANSAS RIVER BASIN

TRINIDAD
JOHN MARTIN

AUGUST 1989

AD
AD
AD

FURGATORIE RIVER
ARKANSAS RIVER

MID-ARKANSAS RIVER BASIN

EL DORADO
KAW
GREAT SALT FLAINS
KEYSTONE
HEYBURN

DECEMBER 1990

TD
TD
TD
TD
TD
TD

WALNUT RIVER
ARKANSAS RIVER
SALT FORK ARK
ARKANSAS RIVER
POLECAT CREEK

UPPER VERDIGRIS RIVER BASIN

TORONTO
FALL RIVER
ELK CITY
PEARSON-SKURITZ-BIG HILL

JULY 1990

TD
TD
TD
TD
TD

VERDIGRIS RIVER
FALL RIVER
ELK RIVER
BIG HILL CREEK

LOWER VERDIGRIS RIVER BASIN

TOFAN
HULAH
RICH
SPITATONK
NOLOGAH

MARCH 1990

TD
TD
TD
TD
TD

CANEY RIVER
CANEY RIVER
RIRD CREEK
HOMINY CREEK
VERDIGRIS RIVER

UPPER NEOSHO RIVER BASIN

COUNCIL GROVE
MARION
JOHN REDMOND

AUGUST 1989

TD
TD
TD
TD

NEOSHO RIVER
COTTONWOOD RIVER
NEOSHO RIVER

LOWER ARK RIVER BASIN

FORT GIBSON
TENKILLER FERRY
JESTER

AUGUST 1989

TD
TD
TD
TD

NEOSHO RIVER
ILLINOIS RIVER
FOITAU RIVER

STATUS OF DROUGHT CONTINGENCY PLANS IN SWD

BASIN/PROJECT	STREAM	DIST	SCHEDULED COMPLETION DATE
UPPER CANADIAN RIVER BASIN CONCHAS	CANADIAN RIVER	AD AD	MARCH 1990
LOWER CANADIAN RIVER BASIN OPTIMA FORT SUFFLY CANTON ACADIA EUFAULA	N. CANADIAN RIVER WOLF CREEK N. CANADIAN RIVER DEEP FORK RIVER CANADIAN RIVER	TD TD TD TD TD	JULY 1990
NAVIGATION PROJECTS NEWT GRAHAM, L&D 18 CHOUTEAU, L&D 17 WEBBERS FALLS, L&D 16 R.S. NEER, L&D 15 W.D. MAYO, L&D 14	ARKANSAS RIVER ARKANSAS RIVER ARKANSAS RIVER ARKANSAS RIVER ARKANSAS RIVER	TD TD TD TD TD	DECEMBER 1990
LOWER ARKANSAS RIVER BASIN BLUE MOUNTAIN HIMROD OZARK-JETA TAYLOR DARDANELLE NAVIGATION L&D'S (10)	FETIT JEAN FOURCHE LA FAVE ARKANSAS RIVER ARKANSAS RIVER ARKANSAS RIVER	L&D L&D L&D L&D L&D	MARCH 1990
UPPER RED RIVER BASIN TEXOMA MAURIKA	RED RIVER BEAVER CREEK	TD TD TD	AUGUST 1989
MID-RED RIVER BASIN FAT MAYSE SARDIS HUGO FINE CREEK BROKEN BOW	SANTERS CREEK JACKFORK CREEK KIAMIACHI RIVER LITTLE RIVER MOUNTAIN FORK	TD TD TD TD TD	JULY 1990
LITTLE RIVER BASIN QUEEN GILLHAM HIFENS MILLWOOD	ROLLING FORK COSSATOT RIVER SALINE RIVER LITTLE RIVER	L&D L&D L&D L&D	NOVEMBER 1989

STATUS OF DROUGHT CONTINGENCY PLANS IN SWD

JANUARY 1989

SCHEDULED COMPLETION DATE

BASIN/PROJECT	STREAM	DIST	SCHEDULED COMPLETION DATE
LOWER RED RIVER BASIN			
COOPER	SULPHUR RIVER	FWD	AUGUST 1990
WRIGHT FATMAN	SULPHUR RIVER	FWD	
LAKE O' THE PINES	CYPRESS CREEK	FWD	
NECHES RIV BASIN			
R. A. STEINHAGEN	NECHES RIVER	FWD	FEBRUARY 1991
SAM RAYBURN	ANGELINA RIVER	FWD	
TRINITY RIV BASIN			
PENBROOK	CLEAR FORK	FWD	AUGUST 1989
JOE FOOL	MOUNTAIN CREEK	FWD	
RAY ROBERTS	ELM FORK	FWD	
LEWISVILLE	ELM FORK	FWD	
GRAPEVINE	DENTON CREEK	FWD	
LAVON	EAST FORK	FWD	
NAVARRO MILLS	RICHLAND CREEK	FWD	
BARDWELL	WAXAHACIE CREEK	FWD	
RAZOS RIV BASIN			
WHITNEY	RAZOS RIVER	FWD	MAY 1990
AQUILLA	AQUILLA CREEK	FWD	
FROCTOR	LEON RIVER	FWD	
RELTON	LEON RIVER	FWD	
STILLHOUSE HOLLOW	LAMPASAS RIVER	FWD	
GEORGETOWN	N.F. SAN GABRIEL	FWD	
GRANGER	SAN GABRIEL	FWD	
WACO	BOSQUE RIVER	FWD	
EDMERVILLE	YESUA CREEK	FWD	
COLORADO RIV BASIN			
HORDS CREEK	HORDS CREEK	FWD	NOVEMBER 1990
O.C. FISHER	N. CONCHO	FWD	
GUADALUPE RIV BASIN			
CANYON	GUADALUPE RIVER	FWD	MAY 1991
RIO GRANDE RIVER BASIN			
ARIZONA	RIO CHAMA	AD	JANUARY 1990
COCHITI	RIO GRANDE	AD	
GALISTEO	GALISTEO CREEK	AD	
JEMEZ CANYON	JEMEZ RIVER	AD	
TECOS RIV BASIN			
CONITA ROSA	TECOS RIVER	AD	FEBRUARY 1990

SECTION V - REGULATION OF
MULTI-PURPOSE PROJECTS WITH HYDROPOWER

SECTION V
HYDROPOWER GENERATION AT SOUTHWESTERN DIVISION PROJECTS

The 17 Hydropower Projects are listed in Table 1. Generation by project for the last five fiscal years are shown in Table 2. Also, generation by the projects, since impoundment, is shown on the following graphs.

TABLE 1

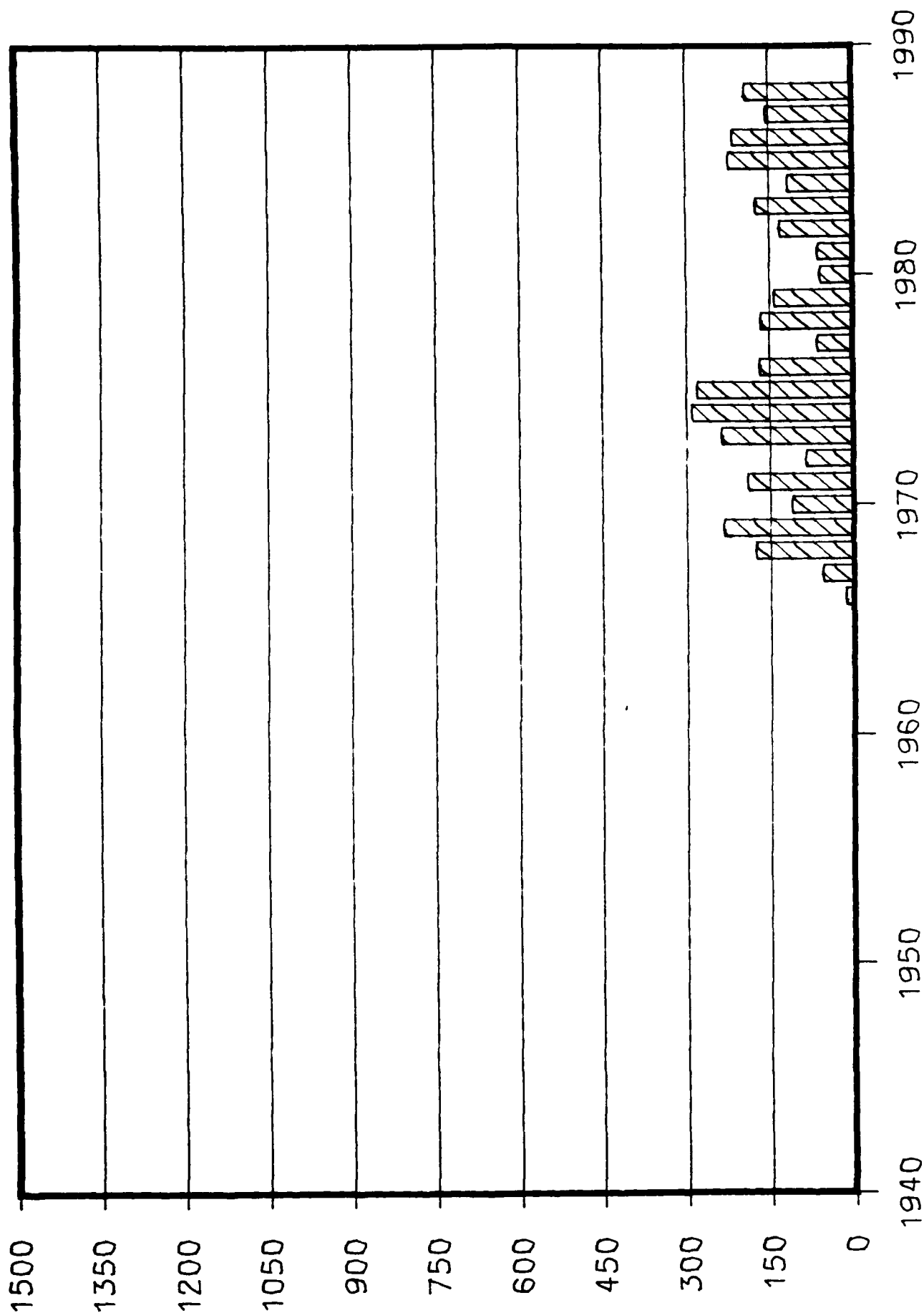
<u>Projects</u>	<u>Basin</u>	<u>Stream</u>	<u>No. Units</u>	<u>Total Capacity MW</u>	<u>Plant No.</u>
Beaver	White	White	2	112	V-1
Table Rock	White	White	4	200	V-2
Bull Shoals	White	White	8	340	V-3
Norfork	White	North Fork	2	70	V-4
Greers Ferry	White	Little Red	2	96	V-5
Keystone	Arkansas	Arkansas	2	70	V-6
Ft. Gibson	Arkansas	Grand	4	45	V-7
Webbers Falls	Arkansas	Arkansas	3	60	V-8
Tenkiller Ferry	Arkansas	Illinois	2	34	V-9
Eufaula	Arkansas	S. Candian	3	90	V-10
R.S. Kerr	Arkansas	Arkansas	4	110	V-11
Ozark-Jeta Taylor	Arkansas	Arkansas	5	100	V-12
Dardanelle	Arkansas	Arkansas	4	124	V-13
Denison	Red	Red	2	70	V-14
Broken Bow	Red	Mountain Fork	2	100	V-15
Sam Rayburn	Neches	Angelina	2	52	V-16
Whitney	Brazos	Brazos	2	30	V-17

TABLE 2

Fiscal Years
(1,000 GWH)

<u>Projects</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>
Beaver	116.3	222.5	214.5	155.1	192.5
Table Rock	471.2	886.0	645.9	432.2	636.3
Bull Shoals	697.1	1397.9	875.0	566.8	897.7
Norfork	209.7	396.1	214.7	126.5	223.9
Greers Ferry	158.3	315.8	148.9	105.7	201.8
Keystone	234.4	306.5	333.0	500.9	312.4
Ft. Gibson	203.6	321.8	294.9	286.7	201.5
Webbers Falls	190.3	320.7	350.9	286.9	197.8
Tenkiller Ferry	78.3	176.3	174.1	147.5	134.7
Eufaula	195.1	360.0	336.1	461.2	282.4
R.S. Kerr	526.5	750.7	725.8	772.9	536.3
Ozark-Jeta Taylor	193.2	437.1	488.0	341.1	334.6
Dardanelle	595.8	823.5	799.6	830.1	600.6
Denison	198.9	343.0	294.5	533.2	291.3
Broken Bow	139.5	229.6	147.4	93.9	142.4
Sam Rayburn	125.3	97.8	105.6	147.4	112.4
Whitney	15.0	57.1	50.8	109.9	17.5

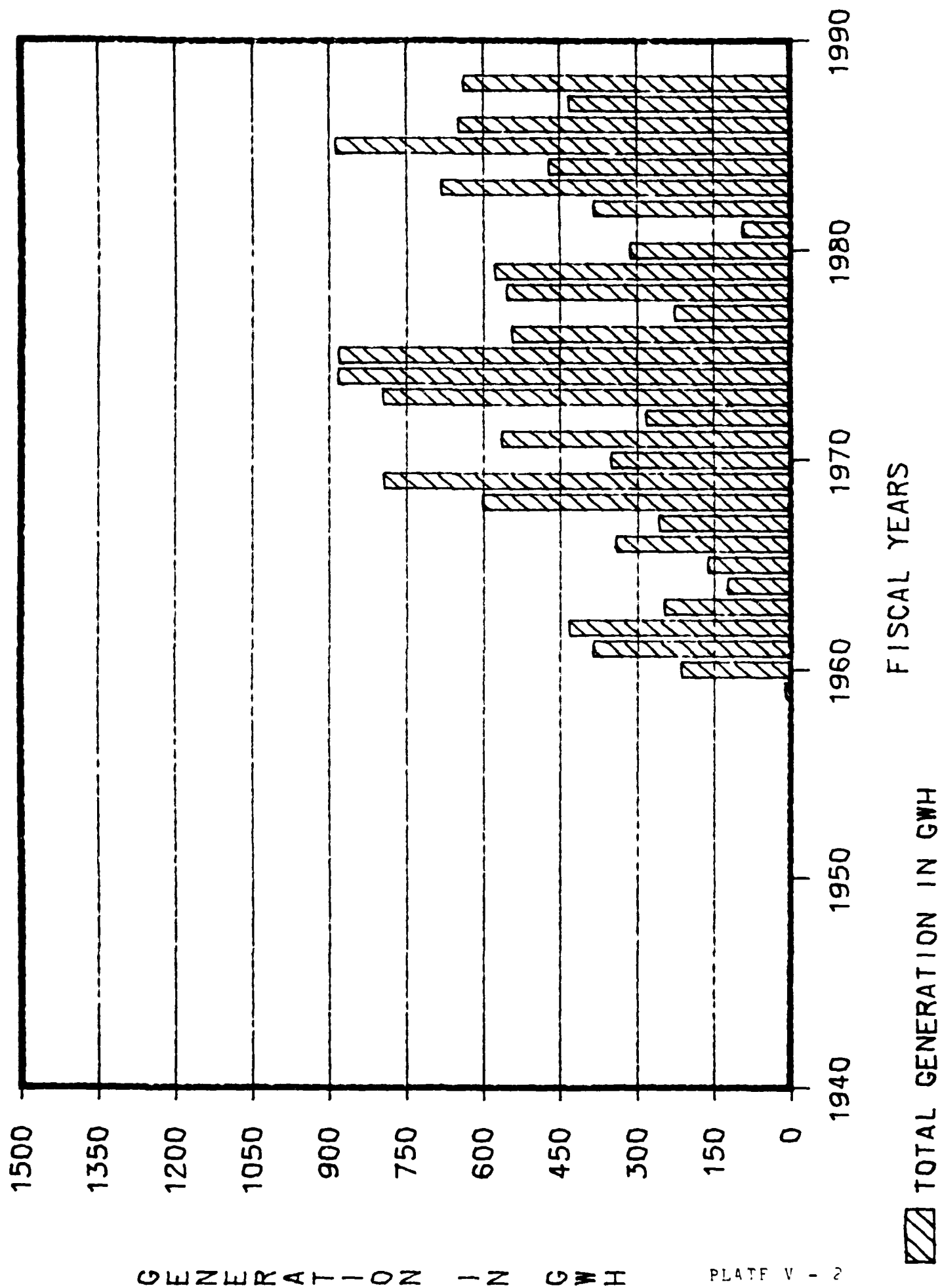
BEAVER



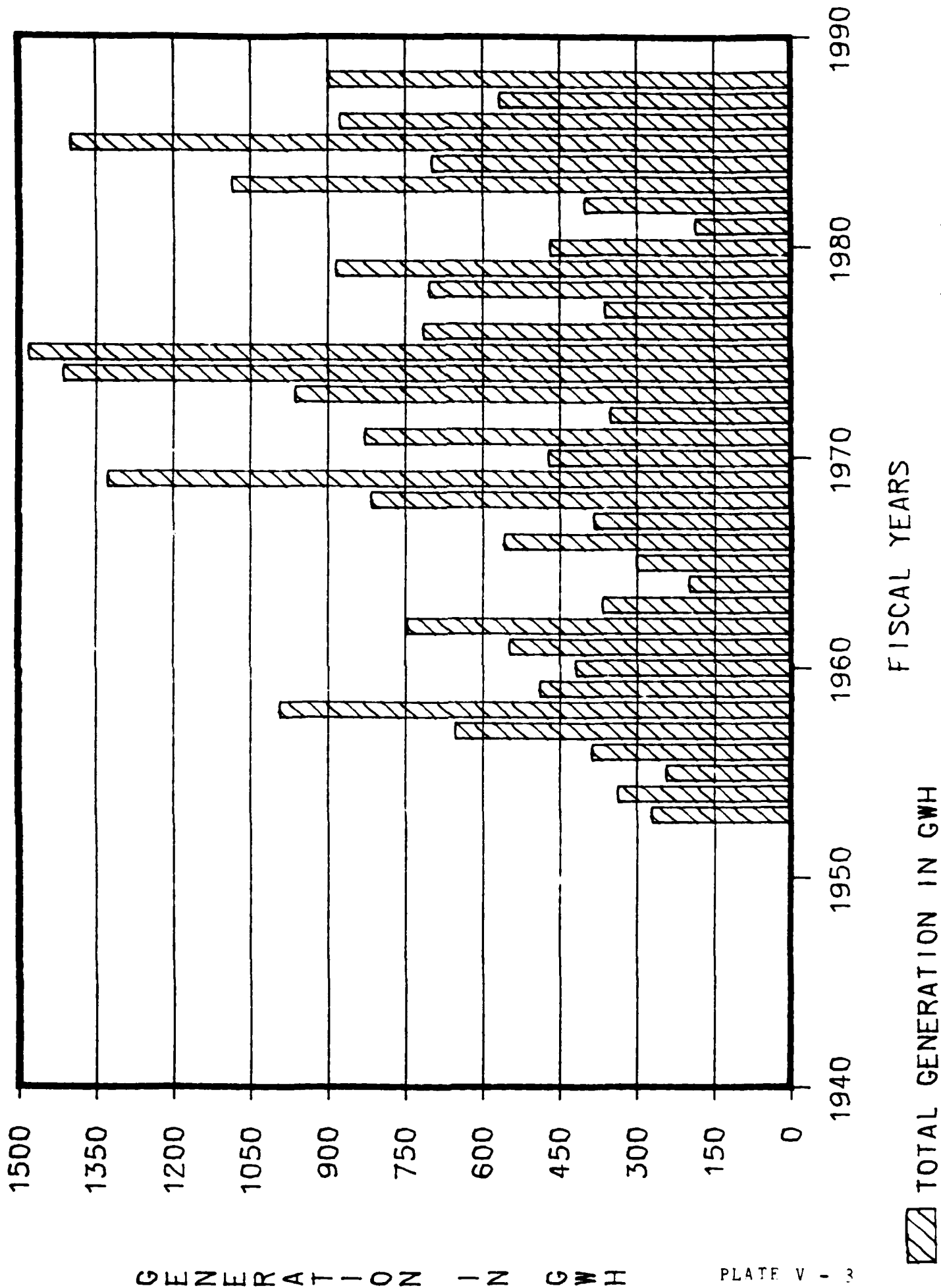
FISCAL YEARS

▨ TOTAL GENERATION IN GWH

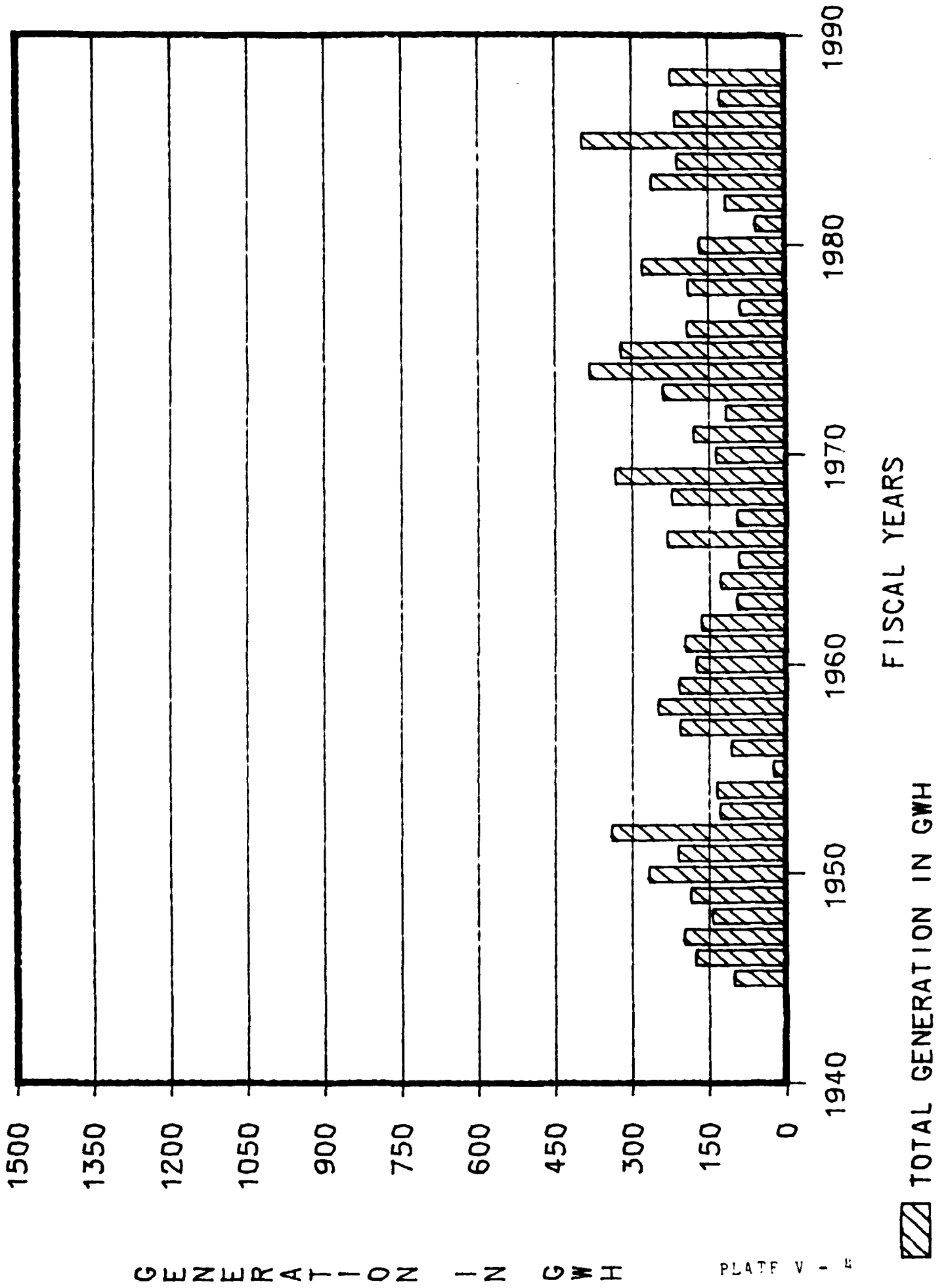
TABLE ROCK



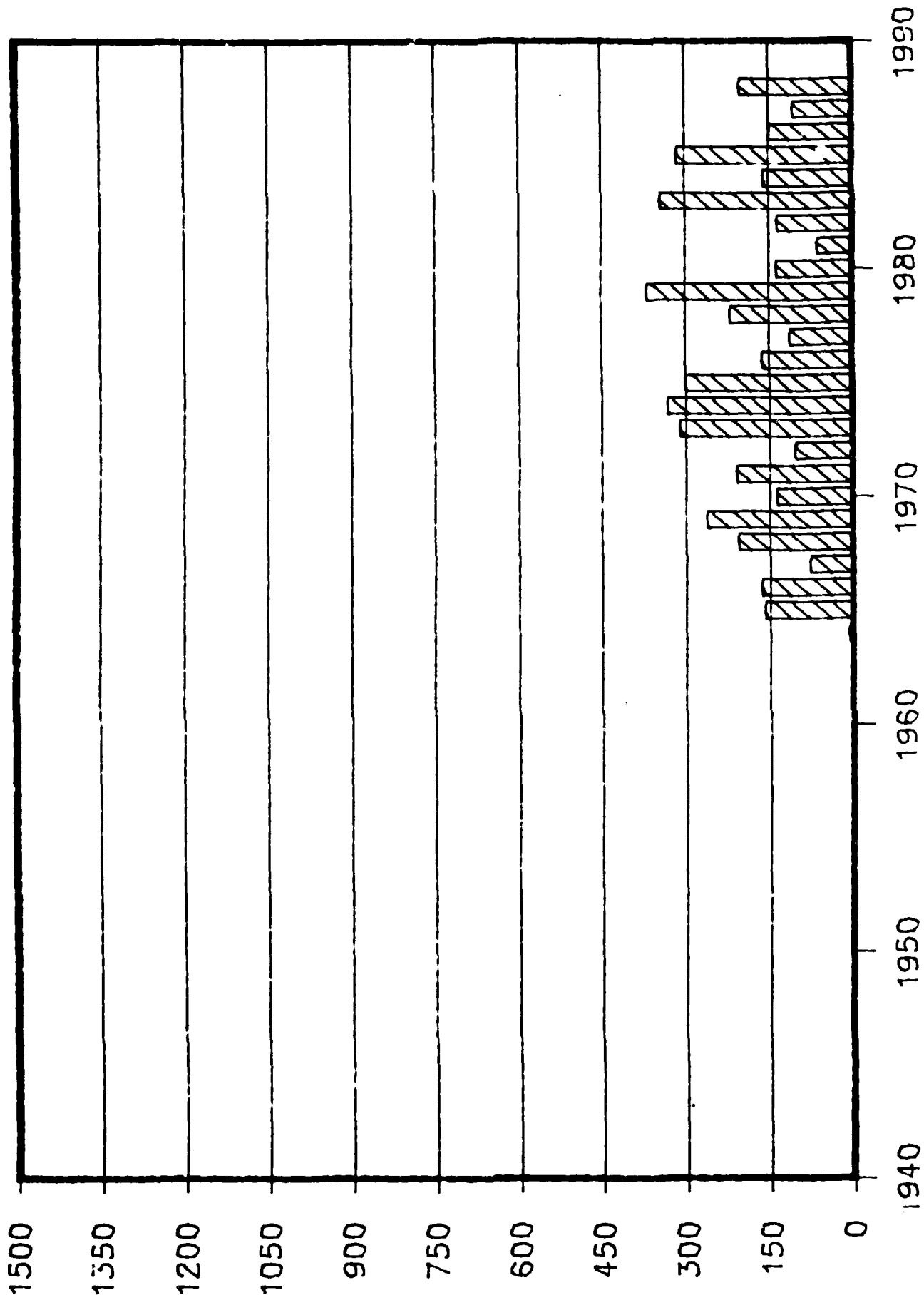
BULL SHOALS



NORFOLK



GREERS FERRY



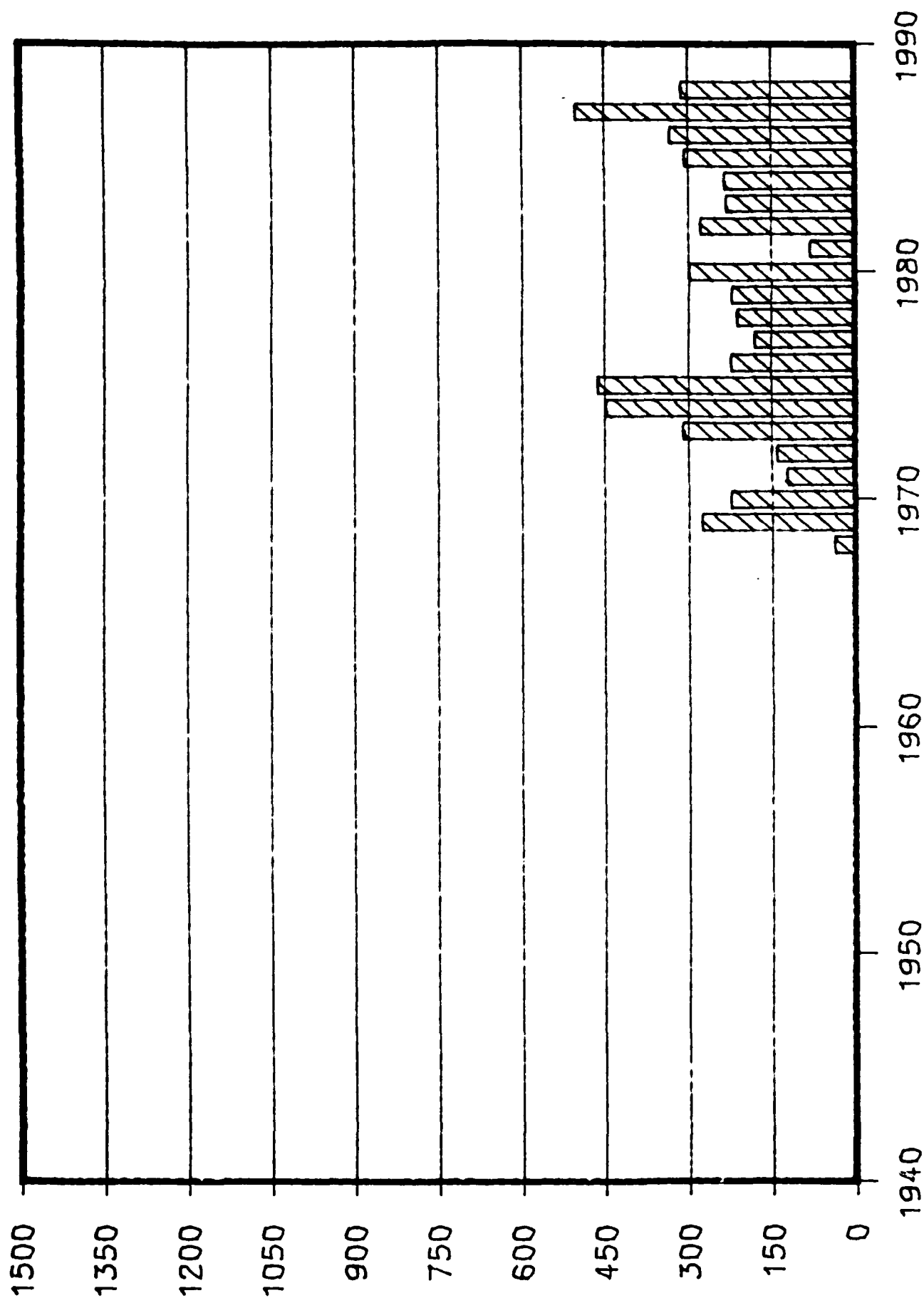
FISCAL YEARS

▨ TOTAL GENERATION IN GWH

GENERATION IN GWH

PLATE V - 5

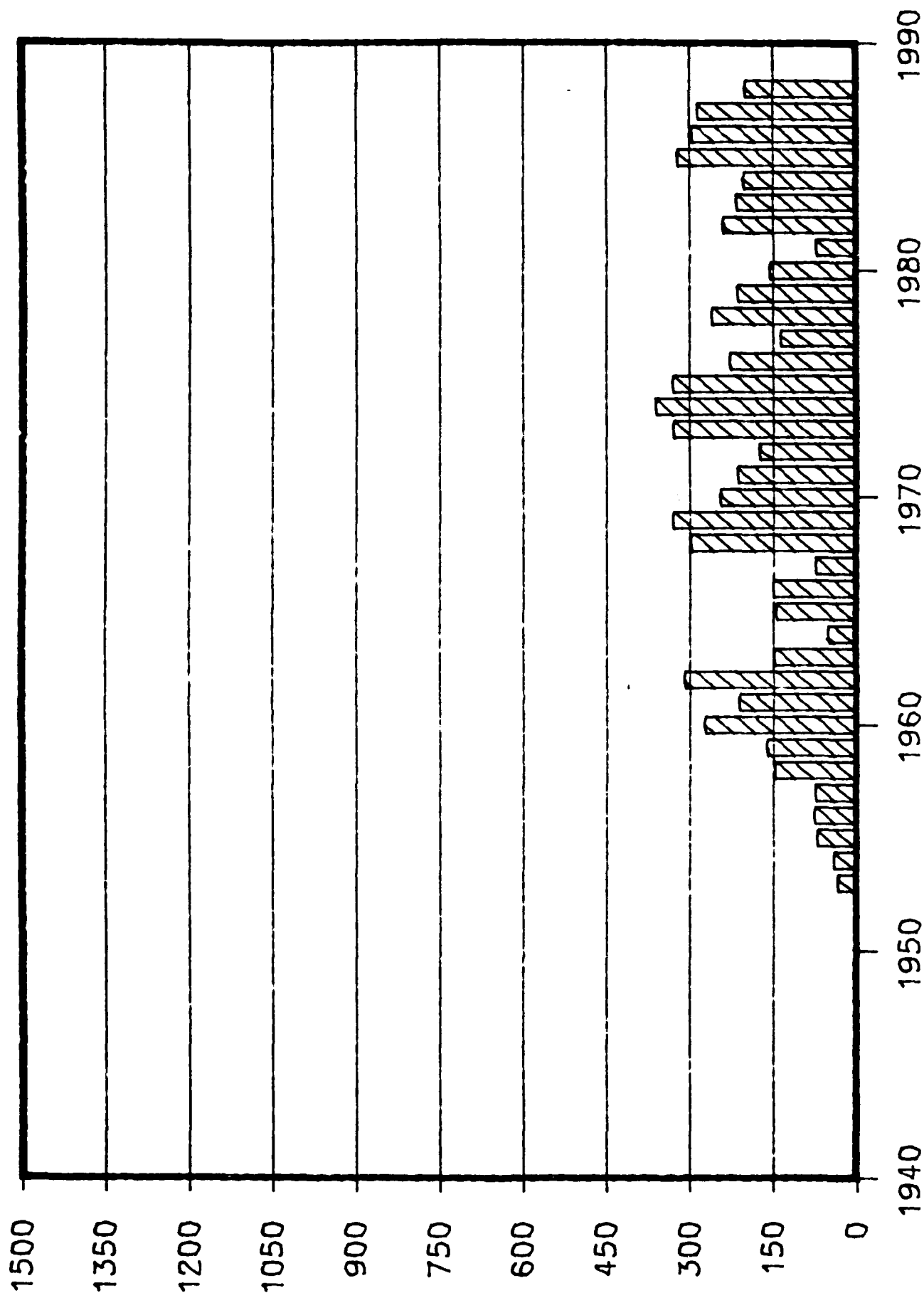
KEYSTONE



FISCAL YEARS

▨ TOTAL GENERATION IN GWH

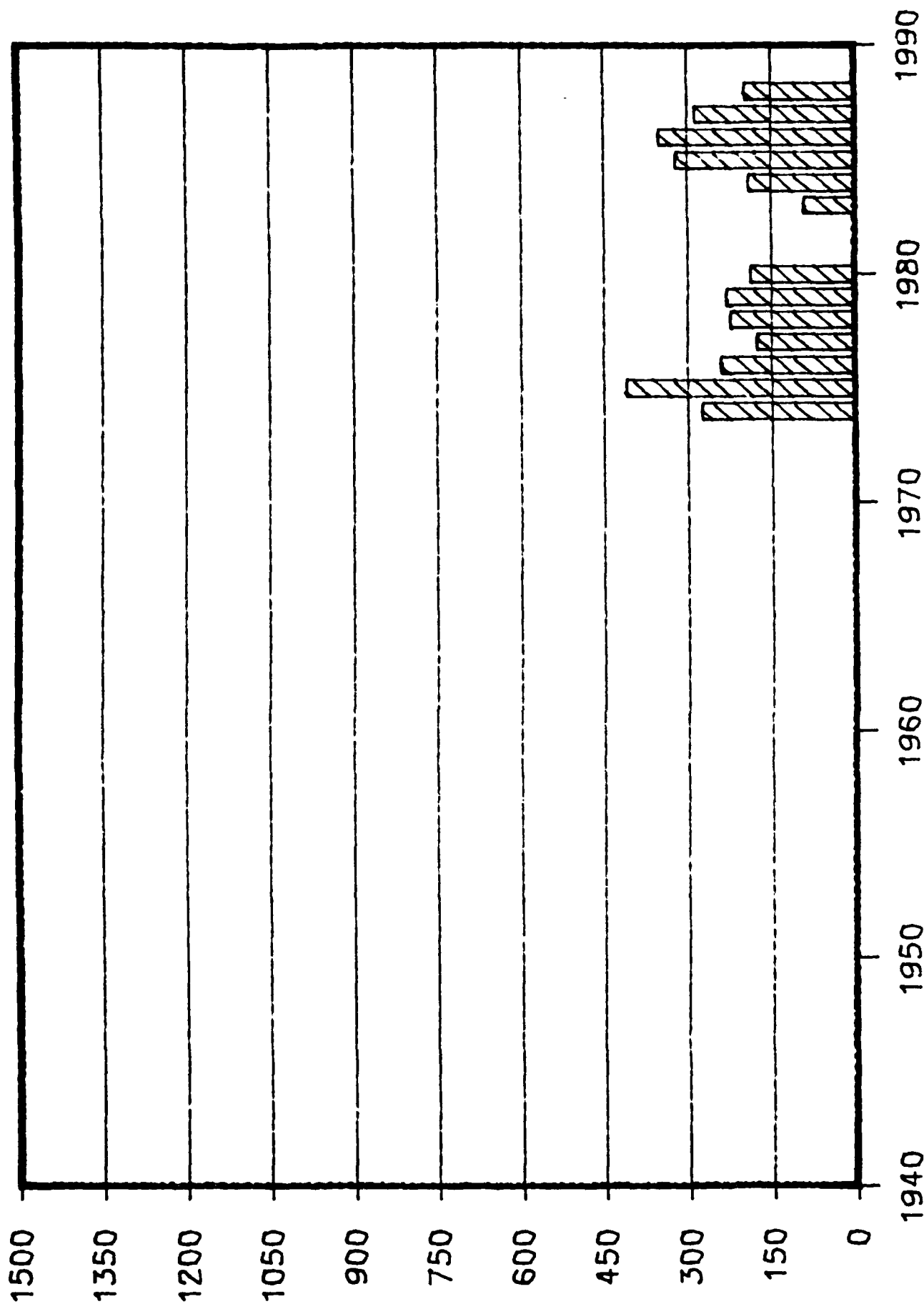
FT GIBSON



FISCAL YEARS

▨ TOTAL GENERATION IN GWH

WEBBERS FALLS

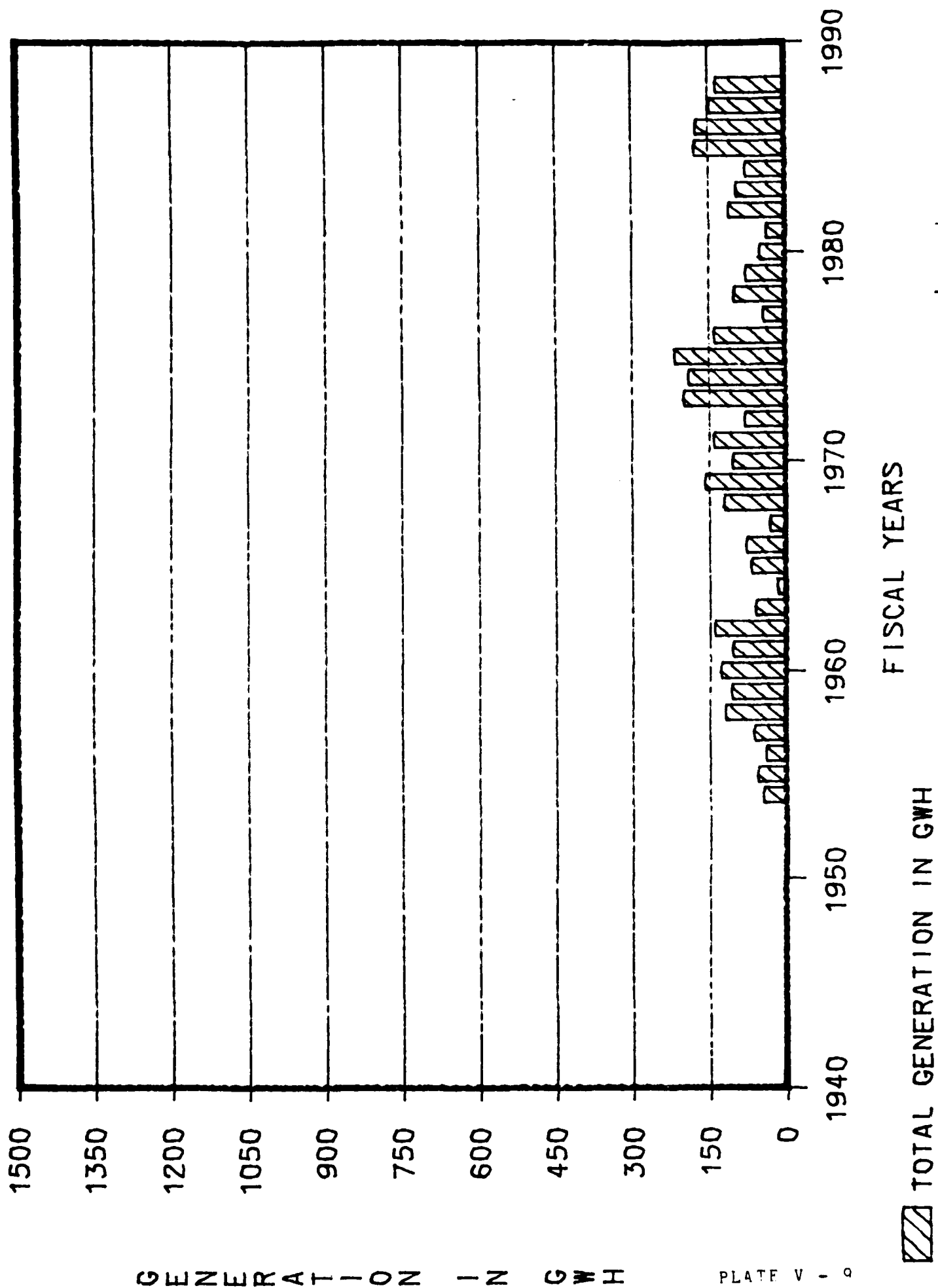


TOTAL GENERATION IN GWH

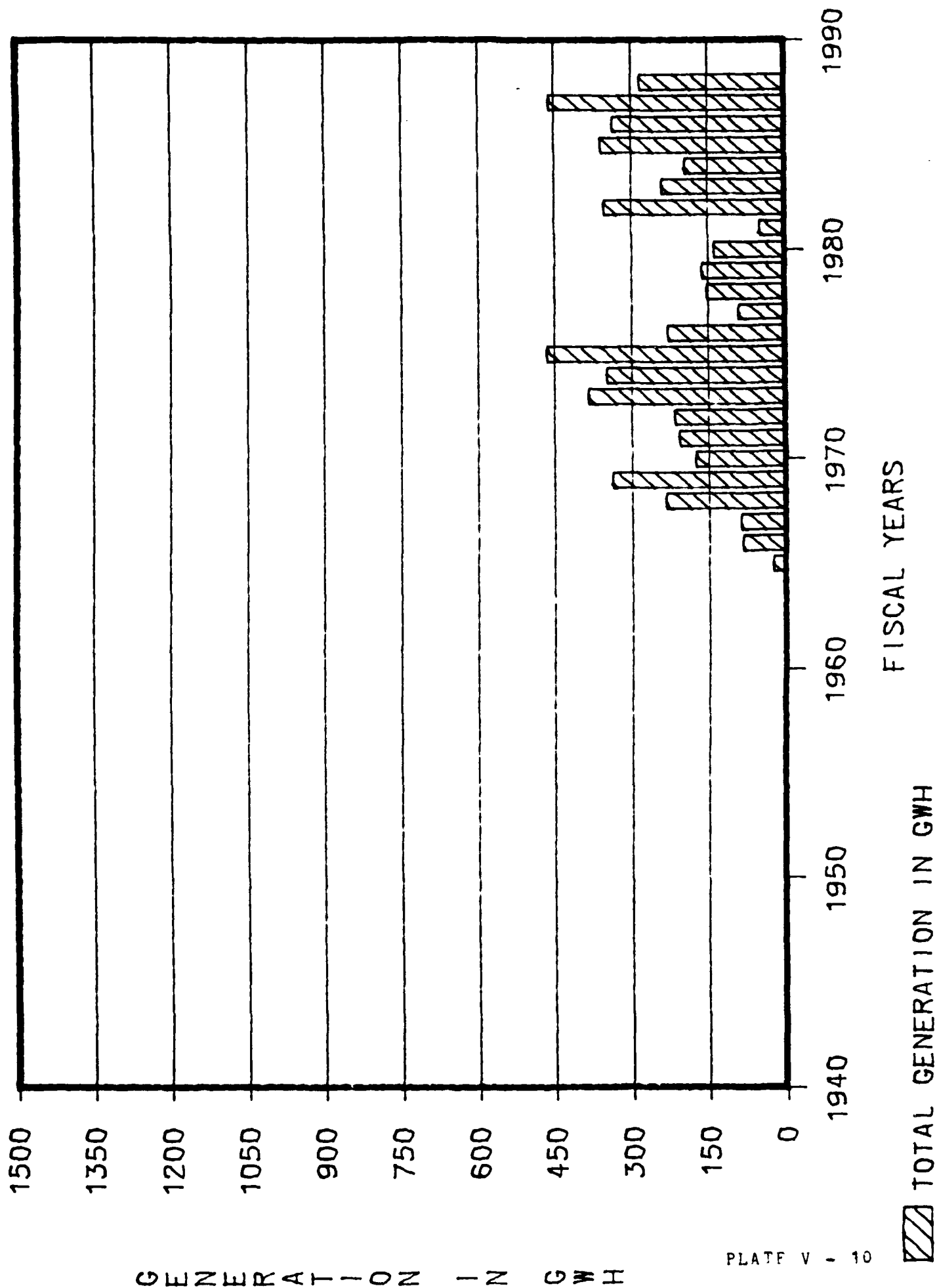


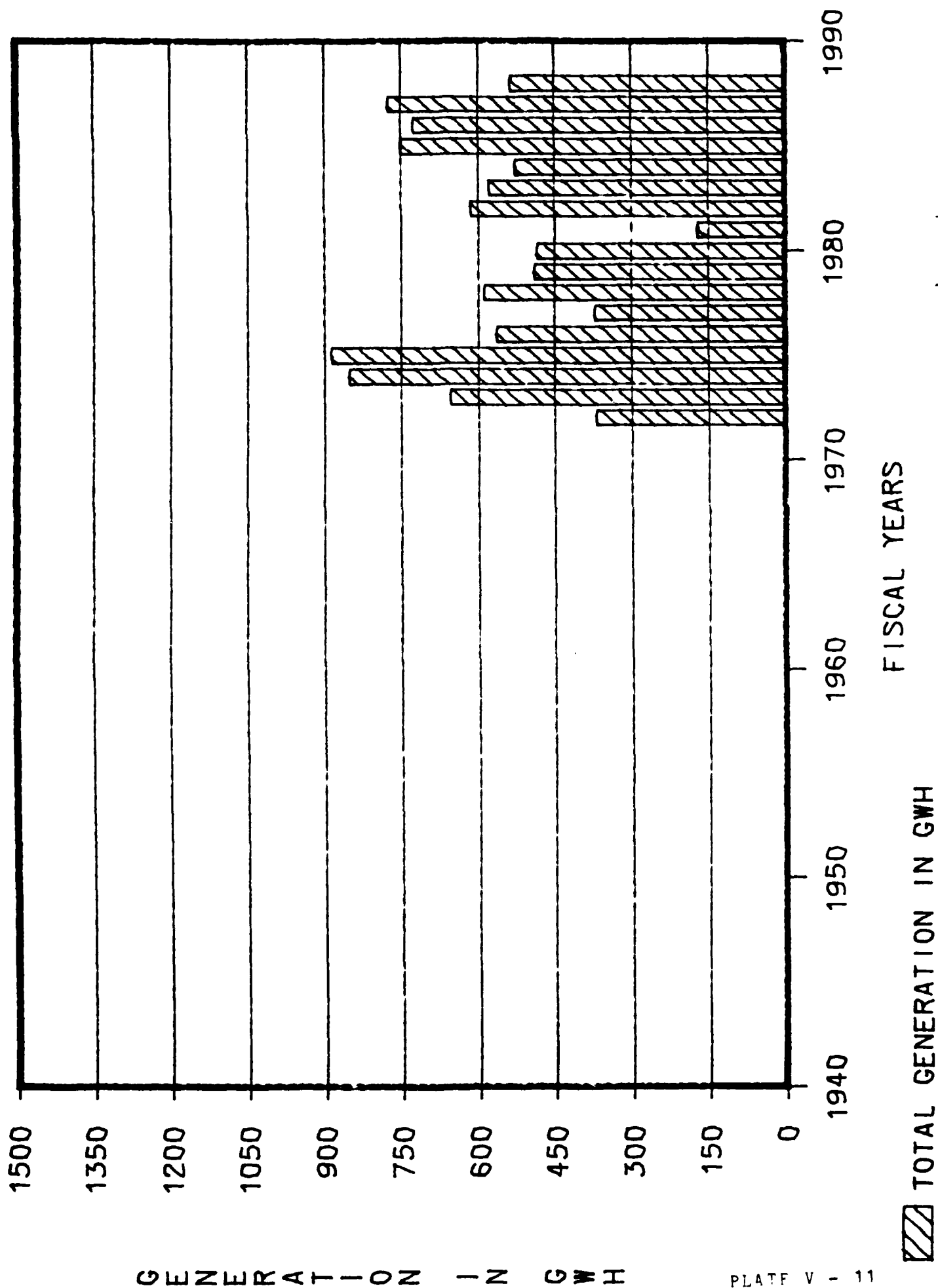
GENERATION IN GWH

TENKILLER FERRY

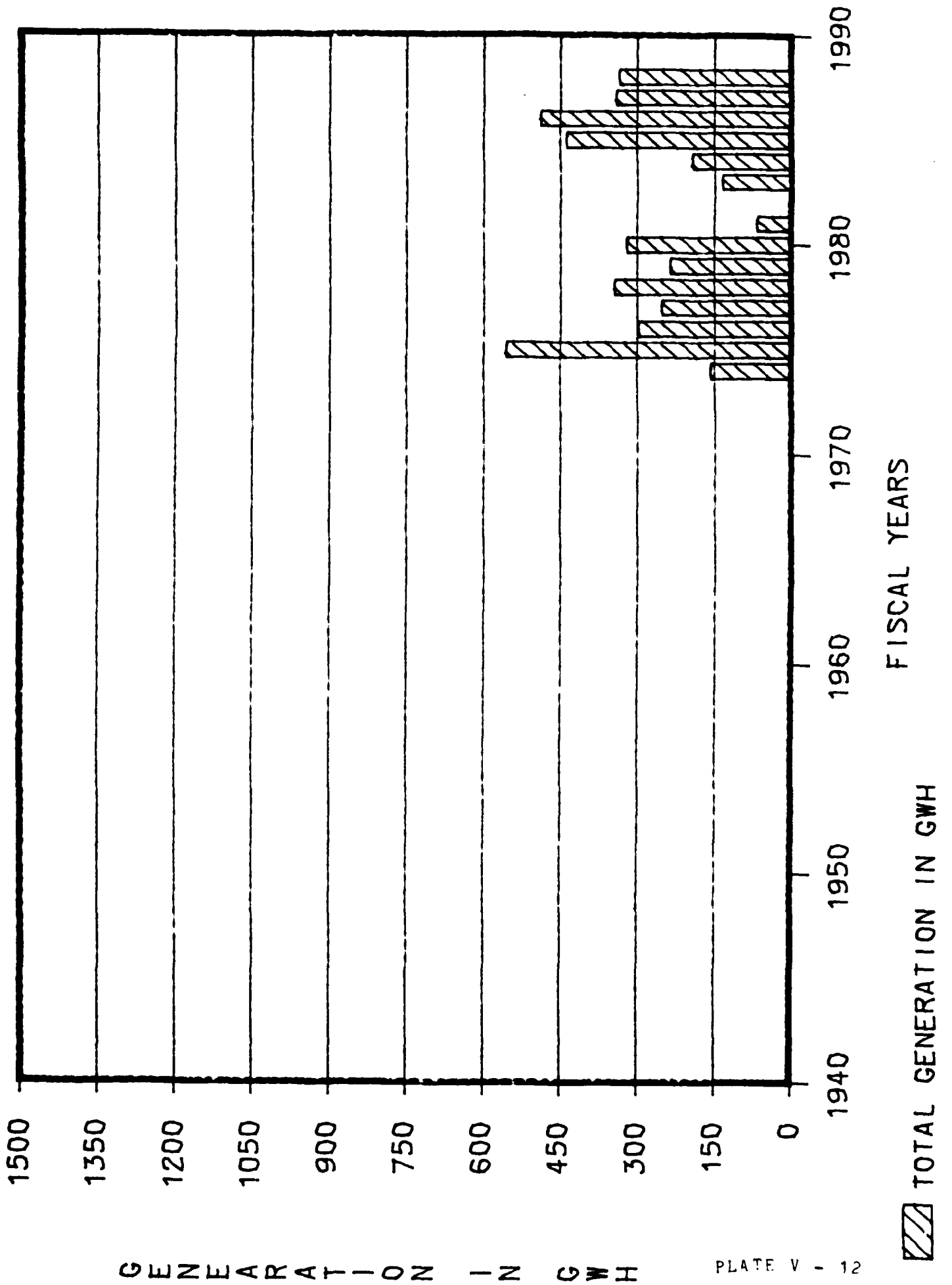


EUFAULA

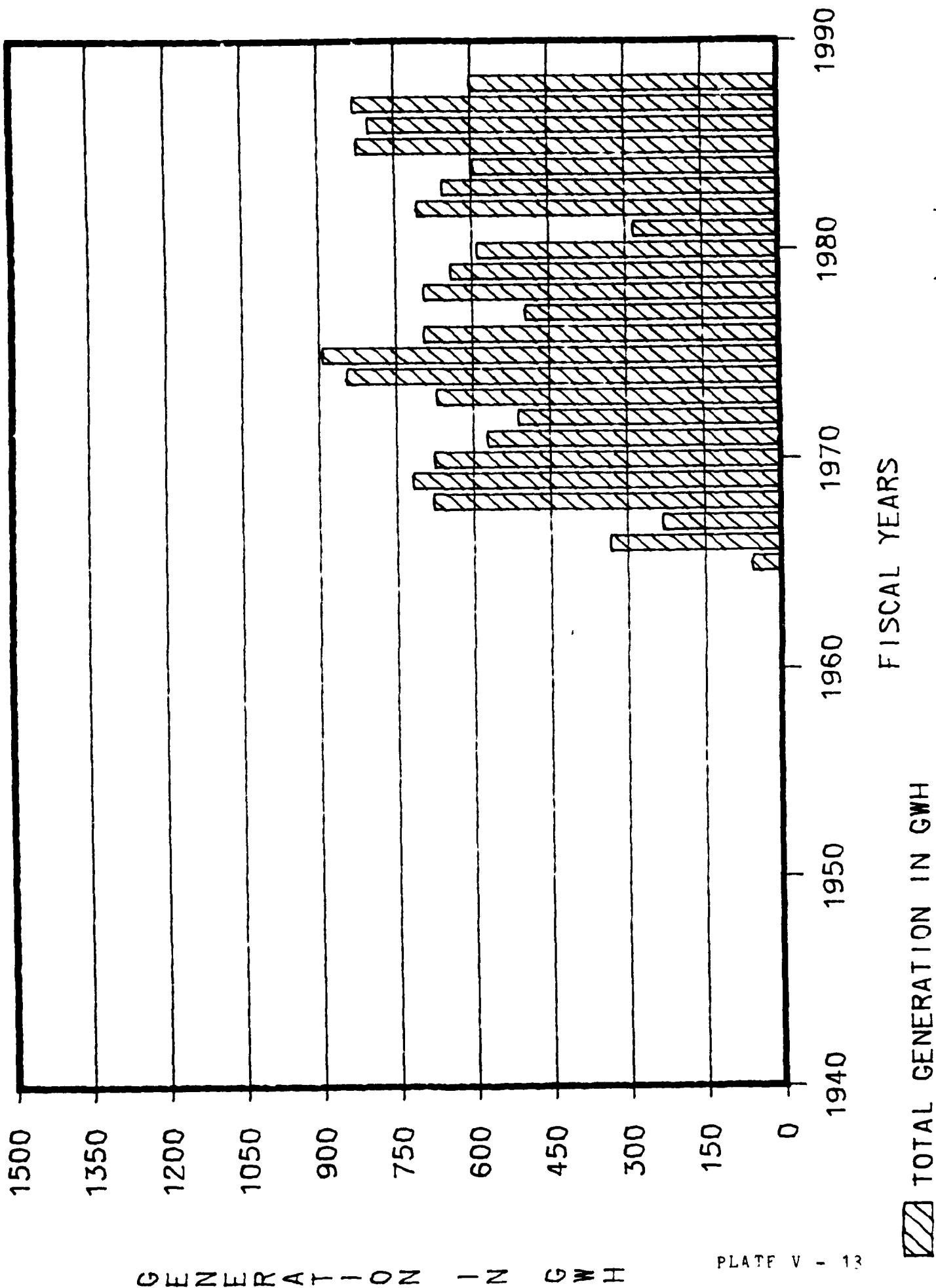




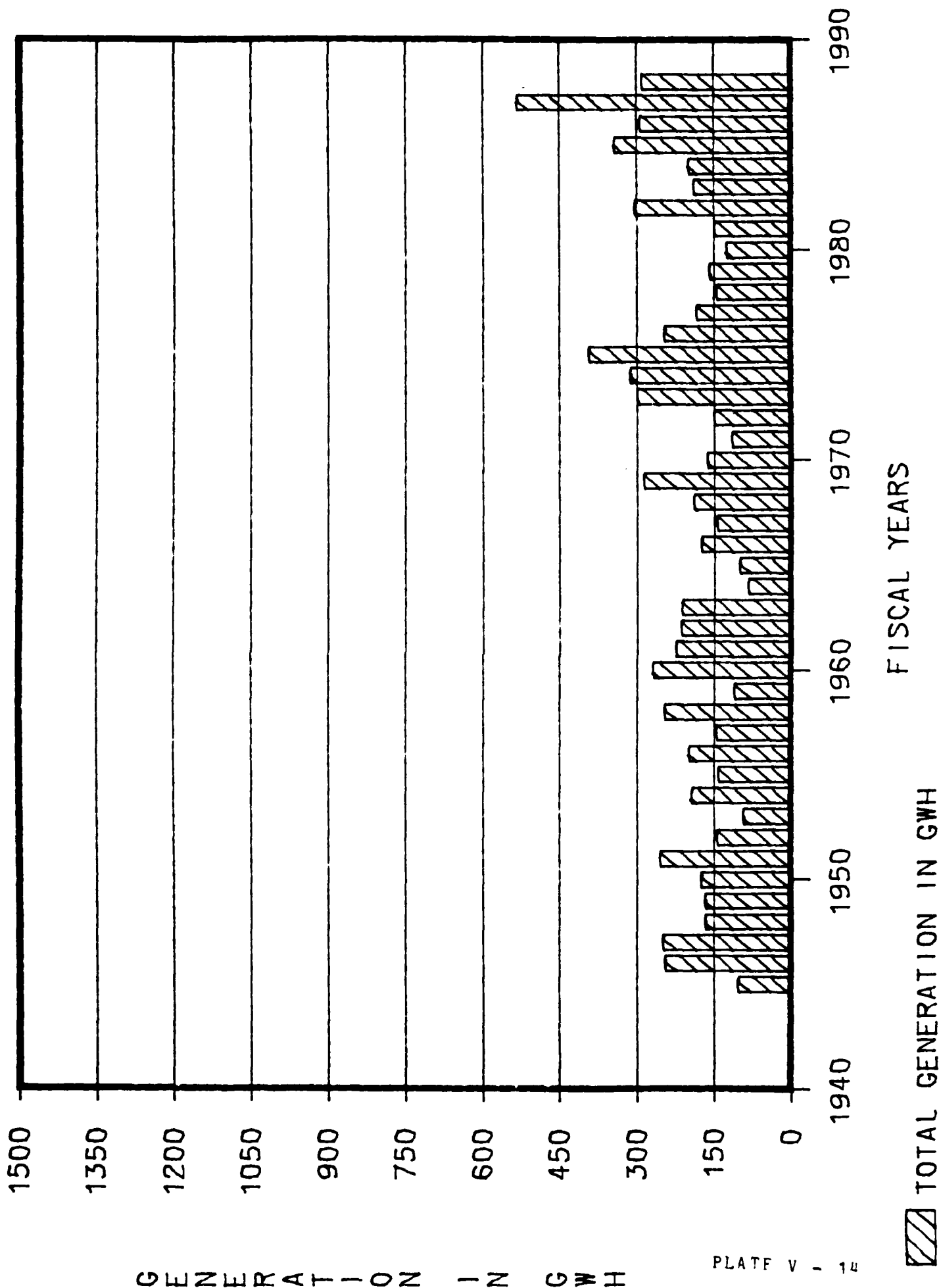
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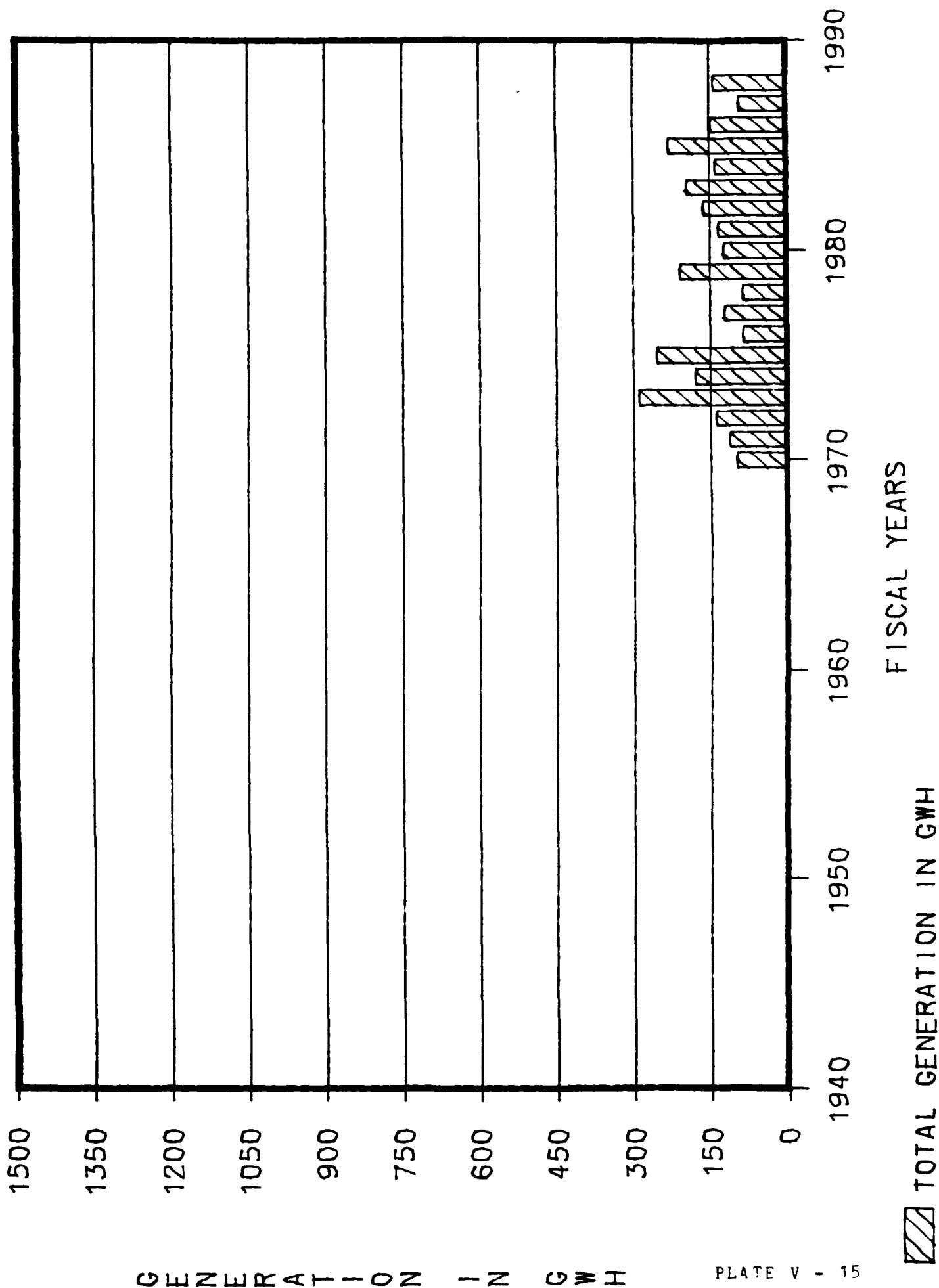
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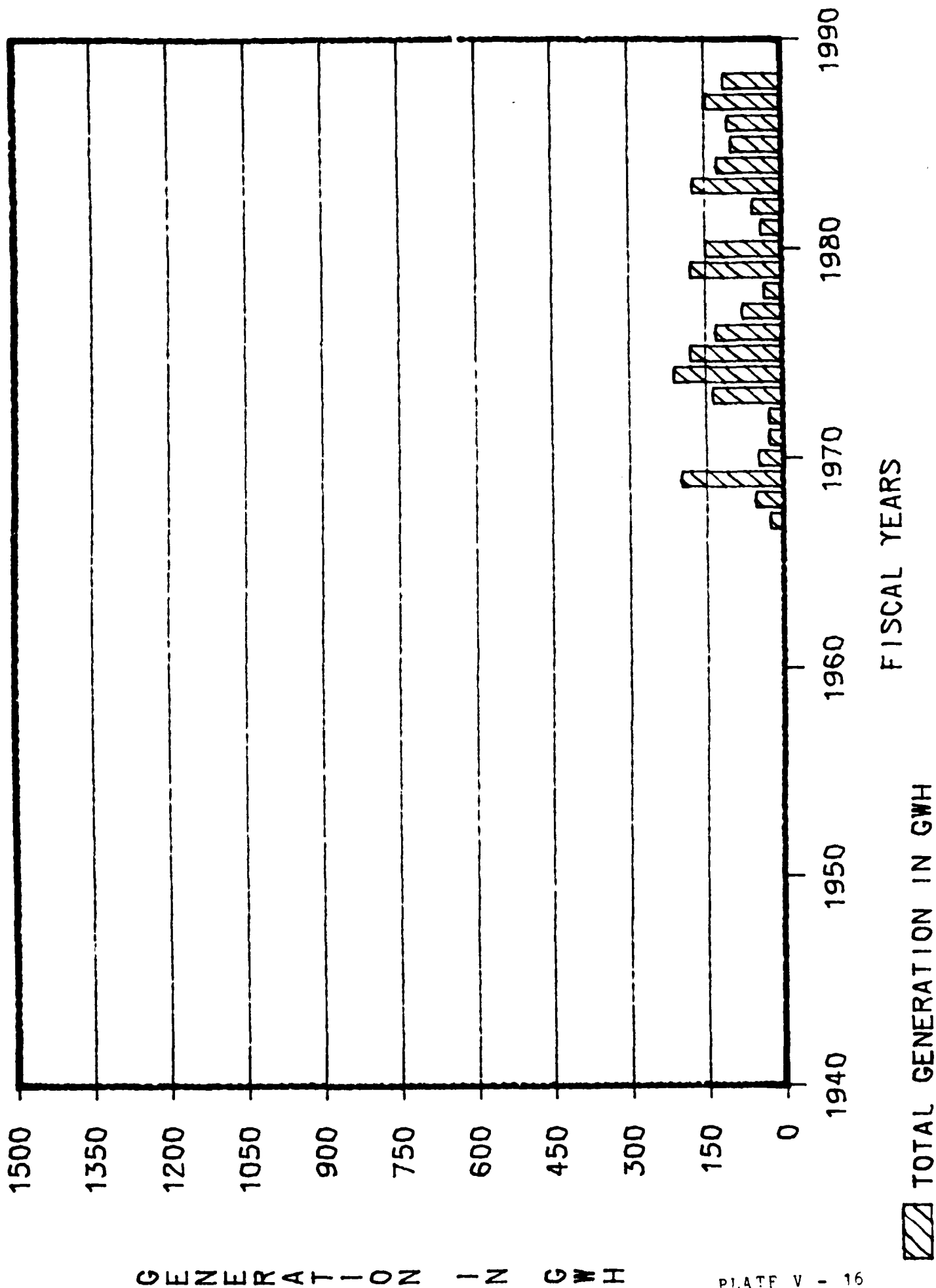
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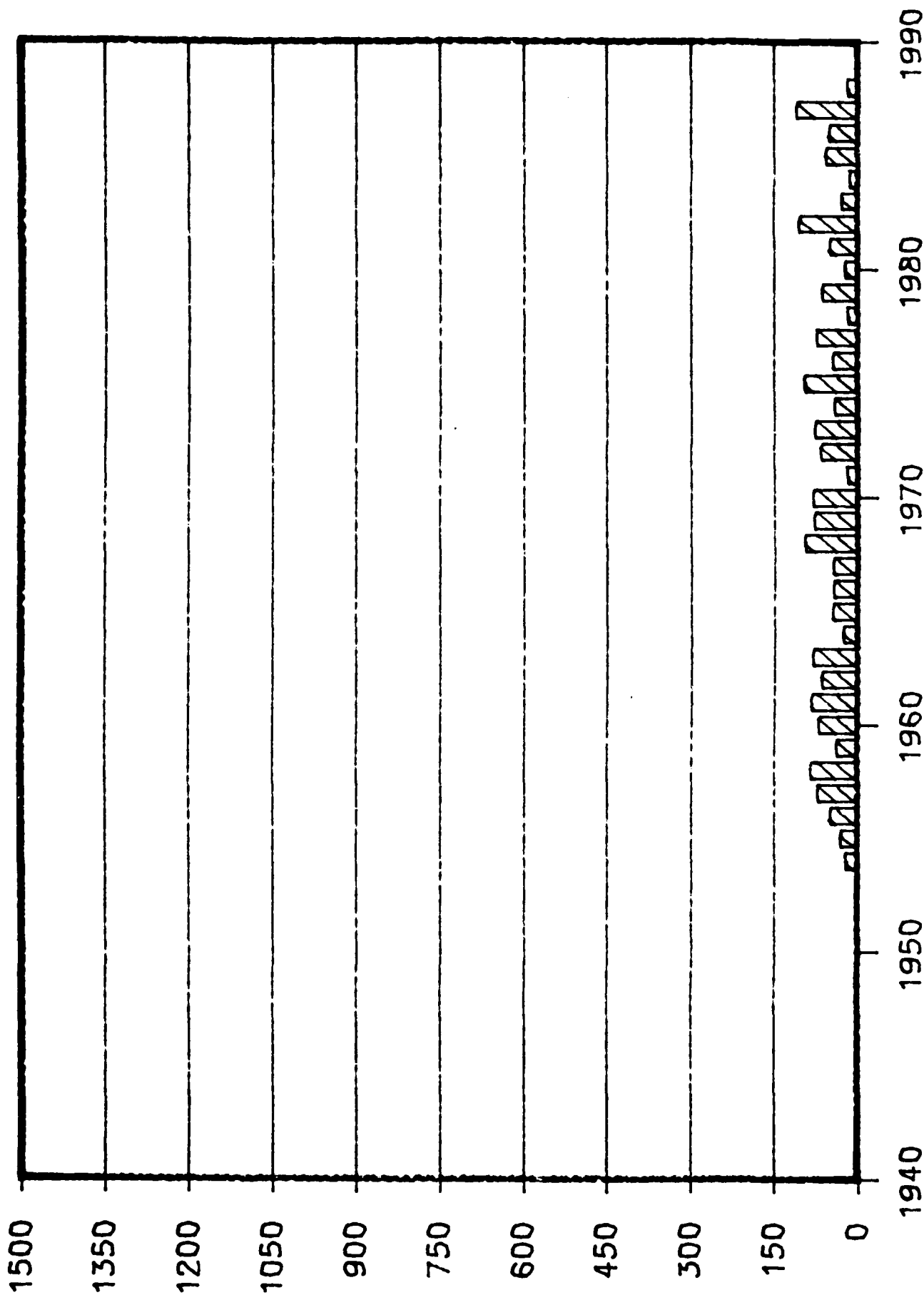


SAM RAYBURN



GENERATION IN GWH

WHITNEY



FISCAL YEARS

▨ TOTAL GENERATION IN GWH

SECTION VI - DISTRICT WATER CONTROL ACTIVITIES

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SECTION VI - DISTRICT WATER CONTROL ACTIVITIES

1. PROJECT VISITATION BY WATER MANAGEMENT PERSONNEL

a. ALBUQUERQUE DISTRICT. During FY 88, Abiquiu, Brantley, Cochiti, Galisteo, Jemez Canyon, Navajo, Pueblo, Santa Rosa, Sumner, Trinidad, and Two Rivers projects were visited by Reservoir Regulation personnel.

b. FORT WORTH DISTRICT. Seven of the twenty-four District reservoir projects were visited by Water Management personnel during Fiscal Year 1988. Canyon and Somerville Lakes were visited in October 1987, Benbrook Lake was visited in February 1988, Georgetown and Whitney Dams were visited in April 1988, Joe Pool and Waco Lakes were visited in May 1988, and Canyon Dam was revisited in September 1988 for inspection of non-federal hydropower facilities. Water Control Manuals, flood control and emergency operation procedures, gate operations and calibration, potential areas of flooding, shoreline and downstream erosion, impacts of project operations, and the Water Control Data System data collection and dissemination were discussed with project personnel during these visits. In addition the impacts of non-Federal hydropower operation were discussed with the Canyon Dam personnel.

c. GALVESTON DISTRICT. On 7 October 1988, Hydrology and Hydraulics personnel visited the Addicks Project Office to discuss operational procedures and interrogate the Alert Base Station for dial-in capability problems with project personnel.

d. LITTLE ROCK DISTRICT. During FY 88 nearly all reservoir control section personnel were able to visit either projects or other sites involved in real time water control operations.

The Section Chief and White River engineer spent two days at Clearwater Lake to tour the project and train Resident Office personnel. Appurtenant structures and recreational areas were seen as well as several downstream sites for a future tailwater DCP. Modifications to the emergency spillway and dam were observed while under construction and effects on project regulation were discussed. Resident Office personnel received training in basic inflow computations, use of the runoff index and shutdown criteria.

The Section Chief and two other reservoir control personnel viewed the low stages on the Mississippi and Arkansas Rivers this summer by helicopter. The flight originated in Memphis, Tennessee and took a course down the Mississippi River to the entrance channel then up the Arkansas River. Particular attention was paid to the low flow conditions and navigability in the entrance channel and the Arkansas River downstream of Lock and Dam 2.

Two reservoir control personnel accompanied streamgaging personnel on a trip to inspect the DCP and gaging equipment at the mouth of the White River (MW-5). Access to the gage was by river and necessitated lockage through Locks 2 and 1. The gage required

lowering due to the extremely low stages on the river this summer.

On another trip with streamgaging personnel the Blue Mountain project regulator was able to observe the installation of conduit for a tailwater gage, tour the project, meet with personnel and observe a gate change while in the gate tower.

The Arkansas River engineer also spent a day with streamgaging personnel at the Blue Mountain project. This trip was to observe work related to relocating the headwater gage during a summer fishery drawdown and enabled the engineer to tour the project as well. The Nimrod project was visited on this trip also.

On a trip to Bull Shoals dam the White River engineer was able to observe changing river conditions immediately downstream from the project due to hydropower releases. Downstream channel conditions were also observed at the confluence with the Norfolk River and at Calico Rock, Arkansas.

Lock and Dam 7 was visited twice this year by reservoir control personnel. One visit was with streamgaging personnel to check the DCP installation and enabled the Arkansas River engineer to tour the control room, gate structure and visit with personnel. The other visit was by two reservoir control personnel to observe the lockage of military equipment enroute from Fort Chaffee, Arkansas to Camp Grayling, Michigan.

e. TULSA DISTRICT. Twenty-three project sites were visited by Reservoir Control Section personnel this fiscal year. The projects visited and purposes for the visits are listed in the following table.

PROJECT VISITATION
DURING
FISCAL YEAR 1988

<u>PROJECT</u>	<u>PURPOSE OF VISIT</u>
Altus	Scheduled reservoir control visit.
Arcadia	Site familiarization.
Big Hill	Site familiarization.
Broken Bow	Periodic Inspection.
Canton	Scheduled reservoir control visit.
Council Grove	Scheduled reservoir control visit.
Denison	Periodic Inspection.

El Dorado	Site familiarization.
Elk City	Site familiarization.
Fall River	Stilling Basin Inspection.
Fort Supply	Scheduled reservoir control visit.
Foss	Site familiarization.
Great Salt Plains	Scheduled reservoir control visit.
Hudson	Scheduled reservoir control visit.
John Redmond	Scheduled reservoir control visit.
Kaw	Scheduled reservoir control visit.
Marion	Scheduled reservoir control visit.
Optima	Scheduled reservoir control visit.
Pensacola	Scheduled reservoir control visit.
Sanford	Scheduled reservoir control visit.
Tom Steed	Scheduled reservoir control visit.
Toronto	Site familiarization.
Webbers Falls	Site familiarization.

2. SPECIAL RESERVOIR OPERATIONS.

a. ALBUQUERQUE DISTRICT. The watersheds within Albuquerque District received well below normal snowmelt runoff in 1988. The Rio Grande Basin observed about 70 percent of normal. This ended a six year stretch of above normal runoff conditions.

Between Jan 88 and 31 Mar 88, 51,000 acre-feet of 1987 carryover storage were released from Cochiti Lake. At the end of Mar 88 there were approximately 73,000 acre-feet of carryover storage remaining. This was initially due to delays in the rehabilitation of the Rio Grande channel below El Paso, Texas, which was being completed by the International Boundary and Water Commission (IBWC). Storage was transferred from Cochiti to the flood control pool in Caballo Reservoir, which is administered by

IBWC, while the channel work was being completed. The Bureau of Reclamation, who is the project owner of Caballo, began noticing increased seepage and small sand boils below the dam in early March. They requested a delay in the Cochiti evacuation concurrent with the emergency evacuation of 48,000 acre-feet of Caballo storage. The remaining Cochiti storage, along with some snowmelt runoff water, was completely evacuated by 15 Jun 88.

Construction of the Abiquiu hydropower project continued in 1988. The conduit was closed from Dec 87 through Feb 88 to permit installation of a steel liner in the conduit. During this period, a flow of 50 cfs was pumped over the dam to meet downstream needs. The installation of the plenum chamber will start in mid Nov 88 and continue through Feb 89.

In Nov 87, Reservoir Regulation personnel participated with the Bureau of Reclamation's testing of the automatic operation of the spillway gates at Sumner Dam. The spillway gates open automatically when the flood space is 60 percent utilized resulting in a large increase in the release. The test showed that these gates open very rapidly and, therefore, every effort will be made to limit the pool elevation to avoid unregulated large changes in release.

On 6 Sep 88, the Bureau of Reclamation began the initial filling of the newly completed Brantley Dam and Reservoir. Brantley Dam consists of a central concrete gravity section with earth sections on either side for total length of about four miles. Dam safety is the primary project purpose. Dam safety evaluations for McMillan and Avalon Dams on the Pecos River revealed inadequate spillway capacities for both. The old McMillan Reservoir is contained within the new reservoir area of Brantley and the dam will be breached in 1989. Avalon Dam is below Brantley and is used primarily as a diversion structure. Additional benefits from Brantley are derived from irrigation, flood control, fish and wildlife enhancement, and recreation. Initial storage allocations are: 2,000 acre-feet inactive, 40,000 acre-feet conservation, 189,700 acre-feet flood control, 617,800 acre-feet surcharge and 116,800 acre-feet sediment space.

In 1988 the staff of the Reservoir Regulation Group initiated the Rio Grande Reevaluation study. This 2-year study, as authorized by Congress, directed the Corps to take the lead in evaluating the operation of the Federal reservoirs in the Rio Grande Basin above Fort Quitman, Texas. The system will be studied to identify opportunities to provide flood protection and additional beneficial use of available water. A status report was distributed in Sep 88 with the final report being scheduled for completion in FY 89.

There were a total of 10 deviations in 1988. Aside from the major ones of which were discussed above, minor deviations assisted construction and maintenance activities, movie filming, and fish surveys.

b. FORT WORTH DISTRICT. Fiscal Year 1988 started out with most lake projects in very good condition. By mid January 1988 rainfall had caused several projects to enter the flood pool. Fourteen flood control projects out of twenty-four used part of their flood control storage at least once during the year. Heavy rainfall in the Brazos River basin caused all but Georgetown and Whitney Lakes to go into the flood pool at least twice. There were thirteen requests from the Fort Worth District to the Southwestern Division for deviations from the approved project plans of Southwestern regulation.

(1) Drought Operations.

By mid-May many parts of the State of Texas were experiencing well below normal rainfall and the beginning of drought conditions. By the end of September yearly rainfall ranged from 68% of normal in the eastern part of the state to 75% of normal in the panhandle region. According to the Palmer Drought Index most divisions within Texas ranged from -2.0 to -2.7. Thus, most of the agricultural area of the state was considered to be in a moderate drought. Much of the eastern third of Texas was gripped in a drought that was causing barren pastures, scarce hay supplies, and lowered cash crop yields. By the end of September, the drought had crept westward to affect the south, southwestern, and west central counties of the state. Soil moisture conditions, however, were still reasonably adequate in far west Texas, the South Plains, the Rolling Plains, and the Panhandle.

Due to the perceived drought conditions and the prospect of the drought only being in the first year of unknown length, the Fort Worth District Water Management personnel undertook the task of preparing Drought Contingency Plans. After several meetings with the other districts in the Southwestern Division, a framework for the plans was adopted. The plans are being prepared by basin and/or sub-basin. The Drought Contingency Plans for the Fort Worth District river basins are scheduled to be completed by the end of 1990.

In May 1988, while much of the state was entering a drought, the Brazos River Authority was requesting large releases from Stillhouse Hollow Lake in order to prove up its Water Rights. A heavy local rainfall of 10+ inches of rain above Proctor Lake, located in the upper Brazos River Basin, caused the failure of a non-Corps lake and the water level at Proctor Lake to go into the flood pool. After several discussions the Brazos River Authority agreed to utilize the flood waters at Proctor Lake (rather than the Stillhouse Hollow conservation water) to meet downstream water needs. This arrangement lasted for approximately 4 weeks.

In mid-July 1988, a locally heavy thunderstorm caused Canyon Lake to go into the flood pool by 9 percent. Because of the perceived drought conditions the Fort Worth District Water

Management personnel, after coordination with downstream interests, requested a deviation from the Plan of Regulation so that the flood waters could be released at a rate that could be utilized by downstream users without waste for the next month.

(2) Non-federal Hydropower.

On 18 November 1987 Canyon Lake had been lowered 8-feet below normal by the Guadalupe Blanco River Authority and the gates were closed. At this time construction was initiated to reline the conduit for non-federal hydropower facilities. Careful coordination by the Water Management personnel for the next five months of closure allowed the conduit to be relined, downstream slide gates with headwall to be installed, and takeout section with penstocks to be constructed. An inspection of the hydropower facilities was conducted in September 1988. Pressurization testing of the conduit and bypass system are scheduled for October and November 1988.

Construction of non-federal hydropower facilities is also underway at Town Bluff Dam on the Neches River. The projected date of completion of construction is April 1989. In addition to the non-federal hydropower facilities under construction at Canyon and Town Bluff, CESWF is also reviewing applications for other projects. License applications are under review for Lewisville, Ray Roberts, Wright Patman, and Lake O' the Pines. Lewisville is the most advanced with the City of Denton having contracted for design, specifications, and plans.

c. GALVESTON DISTRICT. There were no special reservoir operations during FY 1988.

d. LITTLE ROCK DISTRICT. During FY 88 the Little Rock District (LRD) experienced extremes in rainfall and project inflow amounts. The water year was characterized by above average rainfall amounts in the early winter months and below average amounts during most of the summer months in all of the river basins in LRD.

Special operations and activities related to water control projects are summarized as follows:

(a) White River System

(1) In December 1987 basin rainfall amounts in excess of 4 to 5.5 inches above normal caused pool rises in the upper White River basin lakes of from 2 to 10 feet, with 6 feet at Greers Ferry and up to 22 feet at Clearwater Lake. Flood pools were evacuated in time for the second and last major event of the water year in late March and early April of 1988. Basin rainfall amounts of from 2 to 3 inches above normal during this time period produced pool rises of from 1 to 4 feet at all the White River lakes and 16 feet at Clearwater Lake. All flood pools in the upper White River basin lakes and at Greers Ferry were evacuated

by late April to mid May and have remained below their power pools since.

(2) Beginning on 1 May a deviation was put into effect to assist the downstream farmers in planting and harvesting in the lower White River Valley. This deviation reduced the target operating stages at Newport and at Georgetown for the 1988 agricultural season, which is estimated to end on 1 December 1988. This deviation had no substantial effect on the flood control operations in the White River basin.

(3) In July 1988, a drawdown at Greers Ferry was initiated at the request of the Arkansas Game and Fish Commission (AG&FC) to enhance the fisheries of the lake. Coordinated with the Southwestern Power Administration (SWPA), the drawdown was completed in mid August and will extend into FY 89 until the "first winter freeze".

(4) There were seven additional deviations in the White River basin during FY 88. Four were at hydropower projects and involved the SWPA, two were at Clearwater to assist the AG&FC and a canoe race, and the other at Bull Shoals to assist in recovery of a drowning victim. Other special operations involved coordination of releases at Bull Shoals and Norfork for two canoe races on the White River.

(b) Little River System

(1) In November and December of 1987 the Little River system also experienced basin rainfall amounts above normal. Approximately 5.5 inches of rainfall above normal for both months produced average pool rises of from 2 to 15 feet with the largest rises of 21 and 32 feet occurring at DeQueen and Gillham Lakes, respectively. Other minor rises occurred in January and February of 1988 but, as in the White River basin, late March and early April brought rainfall amounts of 5 to 6 inches and caused pools to rise an average of 1 to 5 feet at all the lakes. In light of the drought conditions this summer the basin did experience another minor rise in July and August.

(2) Drawdowns for the Arkansas Game and Fish Commission (AG&FC) to enhance fisheries were completed at DeQueen and Millwood Lakes early this past summer.

(3) There were eight deviations in the Little River basin during FY 88. Three were for canoe races, four for maintenance to boat ramps and clearing of stumps in boating lanes and the last to increase minimum releases from Gillham Lake to prevent potential damage to water supply intake pumps in Millwood Lake.

(c) Arkansas River System

(1) Flows on the Arkansas River were well above

normal during the same time periods that other basins in the Little Rock District (LRD) were receiving above normal basin rainfall amounts. These flows were more of a result from rainfall that occurred in the Tulsa District (TD) though. The flows that were experienced during December through January and March through April were two to three times above average. The trend quickly came to an end as rainfall amounts fell to 2 to 5 inches below monthly normals in Arkansas during March through August of 1988. A navigation emergency was declared in May and assistance was received from the upstream TD projects for a short time. In addition to this deviation there were eight other deviations to raise pool limits to assist navigation and one to provide farmers irrigation water. During the summer months, maintaining navigation on the lower portions of the river was the primary concern. As the Mississippi River receded to a record low at the Mouth of the White River (MW-5) to elevation 104.2 NGVD in early July the Corps had five dredges working to keep the entrance channel navigable. The system was kept open for all but two days.

(2) At Blue Mountain and Nimrod Lakes the rainfall that occurred in November and December produced pool rises of from 1 to 5 feet with maximum rises of 17 to 18 feet, respectively. The events of late March and early April produced pool rises of from 2 to 7 feet.

(3) Blue Mountain and Nimrod each had one deviation during FY 88. The deviation at Blue Mountain was for a drawdown for the Arkansas Game and Fish Commission (AG&FC) to enhance fisheries. It was started in June 1988 and completed in November 1988. The deviation at Nimrod was to provide releases for a water quality study that the Waterways Experiment Station (WES) was conducting.

(2) Studies, reports and investigations related to water control projects are summarized as follows:

(a) The Beaver Dam Safety Assurance Reconnaissance Report published in 1984 recommended study of the seepage beneath Dike 1 which has existed since the initial pool filling operation in 1966. Supplement 1 to the Reconnaissance Report, completed in April of 1986, recommended that a cutoff wall be constructed through Dike 1. In January 1986 a deviation established the top of the flood control pool at elevation 1128.0 NGVD in lieu of 1130.0 NGVD, with the stipulation that water not be held above 1125.0 NGVD in excess of four days, to alleviate the problem and is still in effect. A Request for Technical Proposal was issued to prospective bidders for the cutoff wall in September of 1988. LRD plans to award a construction contract in April of 1989 with a two year construction period anticipated. Beaver Dam has been rated the highest priority dam safety problem in SWD.

(b) White River Lakes Regulation Study. During the early part of FY 88 refinements were made to the candidate plan which was then again presented to the Resident Engineers for comments

regarding the plan's acceptability. The majority of the comments received dealt with the effects of the higher summer pool stages during the recreation season caused by the lower summer regulating stages. An on-board review was also held in February 1988 with these and additional comments, regarding effects on hydropower production and flood control operations, discussed. Further production runs were made to address these and other concerns. To date, a plan that attempts to address all concerns has been produced and is ready for presentation at the District level. Upon completion of this presentation the plan will be ready for Division review.

(c) Table Rock Dissolved Oxygen Study. The modeling of a multilevel intake structure was completed by the Waterways Experiment Station (WES) in April 1988. Results indicate this structure would not achieve the target water quality desired. Therefore, WES has suggested a hypolimnetic oxygenation (hyp-ox) system be installed in the reservoir as a possible alternative measure for meeting the required temperature and dissolved oxygen (D.O.) standards. WES is currently studying the hyp-ox alternative alone and in combination with other alternatives such as penstock oxygen injection and turbine venting to arrive at a solution which minimizes total costs and maximizes D.O. levels. Results will be presented in a report expected to be completed by December 1988. Funding used in FY88 was \$50,000. Funding for FY89 is \$250,000.

(d) The Clearwater Lake Spillway Adequacy Study in 1978 found that the spillway at Clearwater was inadequate to pass the maximum probable flood as it was defined at that time. Subsequent to that study a comprehensive analysis of the seepage through the left abutment was completed in 1981. In May 1986 a revised Reconnaissance Report was submitted to SWD and forwarded to OCE. The report recommended that the seepage be corrected using material excavated from the spillway area, thereby enlarging the spillway at the same time. Also recommended was the addition of a parapet wall along the crest of the dam. The seepage correction and the parapet wall were approved, but not the enlargement of the spillway beyond the seepage excavation requirement. Construction commenced in November 1986 and is approximately 60 percent complete as of September 1988. Construction should be completed by November 1989.

(e) Development of Norfolk Unit Number 3 - The Conway Corporation of Conway, Arkansas has submitted a proposal to the Southwestern Power Administration (SWPA) to become the sponsor for Federal construction of an additional unit at Norfolk Dam. If selected, the Conway Corporation will provide financing for the design, construction and O&M&R of the project in exchange for a power allocation from SWPA. The Corps will be responsible for approving and performing the design, construction and operation of the project.

(f) The Arkansas River Basin Study is a general investigation study. The cost-sharing agreement with the non-federal sponsors was completed in July 1987. The navigation

portion of the study will address the possible need for additional system storage or changes in system operating plans to reduce the magnitude and duration of flows which hamper navigation. The non-navigation feasibility studies will address the need for water supply, flood control, recreation and fish and wildlife in Oklahoma and Arkansas. An "Operational Plan Review Status Report" was completed in March 1988 and addressed three operating plans. The feasibility report is scheduled for completion in September 1990.

(g) The Arkansas River Land Impact Study was initiated as a result of numerous complaints concerning the frequency and duration of flooding along the main stem of the Arkansas River. The study objective is to identify any lands where additional real estate acquisitions are required. The results of these investigations will be reported in a summary letter report and also in a Real Estate Design Memorandum Supplement for each pool where additional real estate actions are required. If, for a given pool, no real estate action is required, data supporting this finding will be forwarded for review in the form of a Hydrologic and Hydraulic Report. The study began in March 1986. The letter report is scheduled to be completed in September 1989. The Real Estate Design Memorandum Supplements are tentatively scheduled to be completed in 1991.

(h) The Beaver Lake Water Quality Study (General Investigations Survey) is a one-year comprehensive study whose purpose is to identify measures to preserve and enhance the quality of the reservoir's water. The quality of the water in the lake has deteriorated due to pollution from both point and non-point sources. Efforts have already been made to reduce the amount of pollution entering the lake from point sources. However, the majority of the pollution is caused by non-point sources, which are more difficult to find and control. The project has been funded and work is in progress. The study report is scheduled to be completed by April 1989.

(i) White River and Tributaries, Arkansas is a general investigation study of the impacts of Little Rock District reservoir operations on navigation in, and recreation activities on, the White River and its tributaries in Arkansas during low-water periods. It has been requested that water releases from the White River reservoirs be modified to augment flows for navigation and recreation. Many times in the summer and fall navigation on the White River is delayed. This increases shipping costs for agriculture and other commerce in the region. Recreational interests are concerned with the effects that low flows have on the trout fishery and the other recreational uses of the river. A reconnaissance report is scheduled for September 1989.

(j) Arkansas/White River Containment Structure. A new channel is developing between the Arkansas and White Rivers. Should this new channel develop the sand laden flows from the

Arkansas River could be carried to the White River. This sediment would have to be dredged from the White River at an annual cost of approximately \$3.1 million. The construction of an extension to the containment structure along the White River Entrance Channel has been approved. The FDM was submitted in April 1988 and a construction contract is scheduled for award in April 1989. The construction is expected to be completed within two years after award of the contract. A fish and wildlife mitigation plan has been approved by the Corps of Engineers and the U.S. Fish and Wildlife Service.

(k) Montgomery Point Lock and Dam (Lock and Dam 0). Low water levels in the Mississippi River at the mouth of the White River cause delays in navigation and increase dredging costs on the White River portion of the McClellan-Kerr Arkansas River Navigation System. Preliminary results received from the Waterways Experiment Station indicate that the only feasible solution is a new lock and dam. Additional testing has confirmed that the most economical location is in the White River channel at approximately mile 0.5. The present schedule calls for submission of a Justification Report in September 1990.

(l) Wilbur D. Mills Dam (Dam No.2). This dam has a history of erosion of the riprap scour protection downstream of the stilling basin. During the December 1982 flood, improperly moored barges in Pool 2 were swept from their moorings and rendered 12 tainter gates inoperable or blocked. The resulting flow concentration caused extensive damage to the scour protection at Dam No. 2. These instances of erosion have required numerous intermittent repairs. Since the dam is constructed on piling, extensive scour could cause the structure to fail. Model studies by the Waterways Experiment Station have determined the most feasible solution is to extend the stilling basin by grouting riprap downstream from the stilling basin end sill. The grouted riprap will be placed by sinking used barges in the desired location. An FY 1990 construction start is planned contingent on approval and funding.

(m) Non-Federal Hydropower Development. A milestone was recently reached in the Little Rock District (LRD) with two of three 10 megawatt (MW) units at James W. Trimble Lock and Dam (No. 13) and one of two 19.5 MW units at Murray Lock and Dam (No. 7) coming on-line. Licenses for non-federal hydropower development were issued and construction is approximately 99 percent complete at these projects on the Arkansas River. The units at Lock and Dam 13 can operate between 3,000 and 110,000 cubic feet per second (cfs) with a maximum release rate of 31,000 cfs. The units at Lock and Dam 7 can operate between 2,600 and 135,000 cfs with a maximum release rate of 38,600 cfs. Also on the Arkansas River, licenses have been issued at Arthur V. Ormond Lock and Dam (No. 9), Lock and Dam No. 3, Wilbur D. Mills Dam (No. 2) and at Nimrod Dam. LRD continues to be responsible for reviewing preliminary permits and applications filed with the Federal Energy Regulatory Commission (FERC) for development of non-federal hydropower at Corps projects or non-Corps projects within the limits of LRD to

ascertain potential impacts on Corps responsibilities. The Corps also has the responsibility to review all designs, plans, and specifications for features which affect the integrity of the existing Federal structure or its operational adequacy.

3. Other significant items relating to water management activities are as follows:

(a) Water Control Data System (WCDS). Reservoir Control personnel are utilizing applications software developed by LRD to enter all daily reservoir data, perform water budget computations, and prepare daily reports and forecasts. The DCP (Data Collection Platform) data are currently being retrieved from the National Environmental Satellite, Data and Information Service (NESDIS) downlink. DCP data are being stored in the Data Storage System (DSS), a data base developed by the Hydrologic Engineering Center (HEC). Modifications continue to be made to the system to more fully utilize DCP data and, thereby, minimize the project reporting requirements for daily reservoir data. Additional software was developed to use DCP data directly from DSS in generating daily reports. The TOTAL data base was installed on the system last year and data is currently being stored in both TOTAL and DSS. Applications programs from HEC and modifications of those programs allow users to view, edit, and plot the data and to generate reports. Software has also been installed to graphically display rainfall data using programs developed by the Tulsa District.

(b) Data Collection Platform (DCP) Status. The Little Rock District (LRD) currently has a total of 91 DCP stations with 36 located in the Arkansas River basin, 13 in the Little River basin and 42 in the White River basin. Of these, 33 are maintained by LRD. Application has been made for 3 new channel assignments which will bring the total number of DCP stations to 94 in the near future. LRD also monitors 20 DCP stations located outside the district as a secondary user. During FY 88, time slots vacated by the Fort Worth, Galveston and Tulsa Districts on the GOES western satellite were filled by LRD resulting in all DCP data currently being received on two channels (7 and 41).

(c) Automation of Field Operations and Services (AFOS). LRD is currently receiving AFOS system data from the National Weather Service (NWS) Tulsa River Forecast Center through a line that also provides data to the Tulsa District and SWD. Selected products are routed to the TOTAL data base and to a printer, while others can be viewed with the VUENWS program. Current software has been added to allow utilization of AFOS graphics products as well.

e. TULSA DISTRICT.

(1) ARKANSAS RIVER BASIN. Flows in the Arkansas River during

FY 1988 were about 140% of normal. The variation of flows throughout the year was much more pronounced than the normal seasonal variation. Flows for the months of December 1987 through April 1988 were about 310% of normal while the flows from June through September 1988 were only 20% of normal. Because of the abrupt change in early May, from flooding conditions to a prolonged drought, it became necessary for the Division Commander, for the first time, to declare a navigation emergency. The declaration was necessary to allow the conservation pools, in some of the storage reservoirs, to be drawn below the limits set forth in the Arkansas River Master Manual to provide the flows needed to keep the navigation system open until maintenance dredging could be completed. The reservoirs used to provide the needed flows were Kaw, Keystone, Oologah, Hulah, Copan, Tenkiller and Eufaula.

Keystone Lake was drawn to elevation 718.5 (top conservation pool at elevation 723.0) in September for tainter gate repair work. The seasonal drawdown scheduled for July at Kaw Lake was foregone due to the drought conditions and to assure that water will be available during January 1989 to help replenish the depleted Keystone conservation storage.

Special releases were made at Eufaula and Fort Gibson in July, August, and September, and at Great Salt Plains and Oologah Lakes in August and September to alleviate fish kill problems. The Kansas Water Office requested water supply releases from John Redmond for the Wolf Creek Nuclear Generating Plant in June, August, and September, and from Council Grove Lake for the City of Emporia in August and September. Oklahoma City requested water supply releases from Canton Lake in July. Annual raft races for various organizations required special releases from Council Grove, Robert S. Kerr, W. D. Mayo, and Keystone Lakes.

(2) RED RIVER BASIN. Flows in the Red River basin during FY 1988 were about 140 percent of normal upstream and 50 percent of normal downstream of Lake Texoma, while annual rainfall was about 70 percent of normal upstream and 60 percent of normal downstream of Lake Texoma. On an annual average, above normal inflows during the winter months generally more than offset below normal inflows during the summer months.

Only one significant flood event occurred during FY 1988. This flood resulted from rains that fell from December 24-27, 1987. The heaviest rainfall was downstream of Lake Texoma, in the lower Red River basin. Rainfall totals during this storm ranged from about 2 1/2 inches at Lake Texoma to about 8 inches in the extreme southeastern part of the Tulsa District. Rainfall totals in southwestern Arkansas ranged from about 5 to 14 inches for this period. Although this was not a major flood, it did result in the third highest pool elevation at Broken Bow and the sixth highest pool elevation at Hugo.

The last half of FY 1988 was very dry. Rainfall was much below normal in many areas in the Red River basin below Lake Texoma. Pool elevations at the end of FY 1988, however, were not

extremely low. Conservation storages ranged from 87 percent full at Broken Bow to 100 percent full at Pine Creek. Lake Texoma reached a low of 612.03 (75 percent of conservation storage remaining) on 16 September 1988, but rose about 4 feet by the end of September as a result of rainfall from the remnants of Hurricane Gilbert.

Several significant events occurred this FY in the Red River basin. The Lake Texoma Advisory Committee was formed and had meetings on 20 January and 24 May 1988. The conservation storage at McGee Creek filled for the first time on 19 February 1988. Also, a Drought Contingency Plan (DCP) was begun for the upper Red River basin (above Lake Texoma). The DCP is scheduled for completion by 31 December 1988.

3. WATER QUALITY PROGRAM AND ACTIVITIES.

a. ALBUQUERQUE DISTRICT. The goals of the Albuquerque District water quality data collection program are to provide an accurate picture of lake conditions as to pH, turbidity, temperature, and dissolved oxygen. Trends are monitored to show improvement or degradation of water quality and the data used to identify public health, fish and wildlife problems.

Readings are made on a monthly basis for the following parameters: surface pH, conductivity secchi disk, and dissolved oxygen and temperature at the surface and at one-meter increments to the bottom.

This data is available in the District Operations Office. The following is a listing of sampling locations for each project:

WATER QUALITY SAMPLING LOCATIONS

<u>PROJECT</u>	<u>LOCATIONS</u>	<u>NUMBER</u>
Abiquiu	Chama inflow, Canones inflow, reservoir near dam, release	4
Cochiti	Bland canyon, reservoir near dam, release	3
Conchas	Conchas and Canadian inflow, reservoir	4
John Martin	Arkansas inflow, reservoir near boat ramp, reservoir near dam, reservoir near Ft. Lyon Hospital, two Lake Hasty locations, release	7
Trinidad	Purgatoire inflow, reservoir near dam, reservoir near Carpios Ridge	4
Jemez Canyon	Inflow, reservoir near dam	2
Santa Rosa	Pecos inflow, reservoir near dam, reservoir near asphalt pit, release	4

Biological samples are tested monthly at all projects. District personnel are trained in the use of a gas chromatograph to test for dissolved nitrogen.

b. FORT WORTH DISTRICT.

(1) For FY 1988, a water quality report for Lake O' the Pines was completed and submitted to SWD for reviews and approval. Of the 24 projects in the Fort Worth District, water quality reports for 15 projects have been completed and submitted to-date. Water quality reports for Waco, Whitney, Belton, Bardwell, Wright Patman and Lake O' The Pines are still pending approval by SWD. No major water quality problems of any significance have been found in any of these projects.

(2) The City of Grapevine installed a destratification system at Grapevine Lake in April 1987 but has not yet determined the effectiveness of the system. At one time during the summer of 1988, a concentration level of dissolved manganese, more than minimum allowable limit was observed. The City is investigating why the higher levels of dissolved manganese occurred following the installation of the destratification system.

(3) Canyon Lake was selected by WES as a research field site for developing techniques by evaluating the impacts associated with lake releases before and after hydropower installation. An intensive water quality data collection for this research project was initiated in the summer of 1988 (prior to power-on-line) and will continue through the summer of 1989 (after power-on-line).

(4) Water quality surveillance at SWF for FY 1989 is \$248,590, compared to \$212,350 for FY 1988 and, therefore, an increase of \$36,240. The increase is associated with additional water quality sampling sites at Ray Roberts Lake and an increase in the cost of sampling.

c. GALVESTON DISTRICT. There were no Water Quality Activities during FY 1988.

d. LITTLE ROCK DISTRICT. The District water quality management programs are divided between the Construction-Operations Division and Engineering Division by functional missions.

(1) Construction-Operations Division Responsibilities. The Permits Branch has responsibility for conducting the District water quality program for Construction-Operations Division. Since the regulatory functions of the branch under the Section 10/404 permit program closely parallel functions of the Division's water

quality management program, field activities are very conveniently and efficiently combined to implement the programs. These responsibilities include the following programs relating to water

quality management.

(a) Reservoir Monitoring. General reservoir water quality monitoring of all Little Rock District reservoirs other than the main stem of the Arkansas River is presently performed three times per year at six to eight stations per lake at various depths. Sample collection in the field and water quality analyses are done by USGS personnel under the Corps of Engineers Interagency Agreement. Approximately 26 parameters are measured to ascertain general reservoir water quality and to provide background data in detecting water pollution. There are no State or other Federal programs which routinely provide these data on the reservoirs operated by the Corps. Data obtained are maintained in the Permits Branch and are stored in and available from STORET, WATSTORE, and annual USGS Water Resources Data Publications for Arkansas and Missouri. Data obtained are used to evaluate basic water quality and long and short term water quality changes, to identify pollution sources, and to properly manage reservoir water quality. Their evaluations include the identification of potential pollution sources so as to enable the Corps to have meaningful input in the decision making processes of other agencies and groups with regulatory authority over basin discharges. These findings are published in Water Quality Management Reports and annual updates for each project. The Greers Ferry and Table Rock Water Quality Management Reports have been published and the Blue Mountain report is in progress. A statistical analysis has been performed on data collection thus far (1974-present) and has proved to be very valuable. Bottom sediment samples were collected from eight LRD reservoirs in 1984 and have been analyzed for organics, nutrients, and metals. This program is conducted pursuant to ER 1130-2-334.

(b) Discharge Permit and Operational Monitoring. Discharge permit and operational monitoring of 34 Corps-operated wastewater treatment systems in the District is performed in accordance with National Pollutant Discharge Elimination System (NPDES) permit requirements. The USGS obtains the necessary monthly samples and analyzes these for Biochemical Oxygen Demand (BOD), bacteria, and suspended solids. Operational monitoring performed twice weekly by the sewage treatment plant operators includes in some cases pH, flow, chlorine residual, dissolved oxygen, and settleability. Operational changes are recommended as necessary. Data are formatted and computer stored in Permits Branch. This program is conducted in accordance with Section 402 of the Clean Water Act which requires reporting to the Department of Natural Resources in Missouri and the Department of Pollution Control and Ecology in Arkansas.

(c) Bathing Beach Monitoring. Monitoring is performed five times monthly by resident area personnel on District bathing beaches during the swimming season to insure safe bacterial quality of reservoir waters. Samples are analyzed by the Missouri and Arkansas Health Departments free of charge. A central log containing results for all projects is maintained by the Permits and Water Quality Section. This program is

administered in accordance with SWD Regulation 1130-2-9 and applicable State laws.

(d) Potable Water Monitoring. Potable water supplies of the District are tested for physical, chemical, and bacterial quality. Samples are collected by resident area personnel and mailed to the appropriate health departments, which perform the analyses free of charge. When tests indicate a bacterial problem, corrective measures are immediately taken. In some cases chronic problems detected by this sampling causes wells to be replaced or reworked. Permits Branch personnel collect samples for complete chemical analysis by the health departments on each new water supply and for periodic nitrate analysis thereafter. Data obtained are used in the periodic sanitary survey and report forwarded to SWD for reporting to OCE. This program is conducted in accordance with ER 1130-2-407 and applicable Federal and State drinking water standards for non-community water supply systems.

(e) Dredged Material Analysis. Periodically, a bottom sediment survey is performed at twelve locations along the Arkansas River navigation project and less frequently at other locations on other District rivers and reservoirs. Sediment and water column samples are frozen and sent to SWD laboratory for sediment, water, and elutriate analyses. The purpose of this program is to detect potential effects of dredging operations on water quality, and to have these data available for the required 404(b)(1) evaluations of future Corps and private dredging. These operations include both commercial dredging under Corps permits and channel maintenance dredging performed under Corps of Engineers contract.

(f) Pollution Complaints and Hazardous Substances. Permits Branch and Resident Offices receive calls reporting instances of pollution and hazardous substance spills. These reports are coordinated with the appropriate Federal and State officials. On occasion, Corps personnel investigate these pollution complaints to verify existing conditions and determine effects on project operations. During oil and other hazardous substance spills, Corps personnel participate in notification and other emergency measures with Coast Guard and EPA officials and when so designated, act as the Federal on-scene coordinator for these two agencies under the National Contingency Plan. The LRD Oil and Hazardous Substances Pollution-Contingency and Spill Prevention, Containment and Countermeasure Plan was rewritten and updated as of August 1983.

(g) Special Activities. Permits Branch periodically assists Engineering Division and Planning Division in obtaining samples and analyses for special water quality and planning studies. Coordination is also accomplished on studies being performed by other agencies such as the EPA, Health Department, Soil Conservation Service, etc. Cooperative water quality studies are periodically conducted with other agencies in monitoring activities authorized under Corps Section 10 and 404

permits. Permits Branch personnel are also involved on a daily basis with personnel from the Arkansas Department of Pollution Control and Ecology in the processing of Corps permits and resolving the water quality matters arising therein.

(2) Engineering Division Responsibilities.

There is no specific organization for water quality studies within the Engineering Division. Responsibility is assigned to the various elements based on the nature of the program study.

(a) Reservoir Profile and Release Monitoring. Water quality data have been collected at Beaver, Table Rock, Bull Shoals, Norfork, and Greers Ferry Lakes since 1966; at Blue Mountain, Clearwater, and Nimrod Lakes since FY 81; and at DeQueen, Dierks, Gillham and Millwood Lakes since April 1981. Presently, monthly profiles of pH, temperature, dissolved oxygen, and specific conductance are obtained from the 12 reservoirs, as well as a gravel sample below each dam. Additional profiles are obtained from Table Rock Lake during critical times of the year. These data are used in the design of the operating features needed for preventing or lessening water quality problems downstream of the dams. They also contribute to the water control management of releases from Table Rock and to maintain acceptable temperatures downstream of all reservoir projects from May through October. Hydraulics Branch is responsible for this program and data collection is contracted to USGS.

(b) Special Studies. The Hydraulics Branch in conjunction with the Planning Division, periodically conduct water quality studies as part of normal project planning efforts such as preparation of survey reports, design memorandums, and environmental impact statements.

(3) Laboratory Capabilities. Water quality analysis performed at the District level are limited to the following capabilities:

(a) Field testing of water quality which may be conducted by the Corps personnel includes dissolved oxygen, temperature, pH, specific conductivity, Secchi Disc measurements, and others using HACH field test kits approved by EPA.

(b) A small laboratory located in Construction-Operations Division can perform the following analyses: dissolved oxygen, color, turbidity, alkalinity, hardness, and others using colorimetric methods of analyses.

(4) Data Management. Reservoir water quality data collected and analyzed by USGS are entered into WATSTORE and STORET, the computerized data management systems of the USGS and EPA, respectively. These data are also published in the annual USGS water resources reports for Arkansas and Missouri. Results of potable water, bathing beaches, NPDES, and other monitoring are kept in computer storage, log books, or files as appropriate. Special data collection results are contained in the reports

dealing with the specific subject for which data were collected.

e. TULSA DISTRICT. Environmental Resources Branch performed several water quality studies during FY 1988.

(1) Lake Texoma Netpen Aquaculture Demonstration Project. Environmental Resources Branch continued to collect data at Lake Texoma for determining the effects of netpen aquaculture of channel catfish on lake water quality. Data were collected biweekly during the fish growing season. Activities included field measurements, laboratory analysis of water and sediment samples for a number of physicochemical parameters, sediment trap experiments, and determinations of in-situ sediment oxygen demand. The study is a three-year project to be completed during FY 1989. Results of the study will be summarized in a final report and will provide a basis for a computer model capable of predicting water quality based on varying conditions of facility design, hydrodynamics, morphometry, and existing water quality.

(2) Release Plans for the Prevention of Fish Kills. Environmental Resources Branch, in cooperation with Operations and Engineering/Construction Divisions, developed release plans for minimization of summertime fish kills at several Tulsa District projects. Activities included computer modeling and evaluation of test releases at these projects. As a result of these activities, no major fish kills occurred in the Tulsa District during the summer of 1988. Similar plans for all Tulsa District projects will be developed at a rate of approximately five per fiscal year.

(3) Development of Sediment Oxygen Demand (SOD) Methodology. A field device for determination of in-situ SOD was developed by the Environmental Resources Branch. The device is a dome-shaped apparatus that isolates and circulates water over lake or river sediments. SOD rates are determined by monitoring oxygen depletion rates within the dome. While the device was developed primarily for use in the netpen study at Lake Texoma, it should prove valuable in a number of water quality studies at other projects.

(4) M&I Water Suitability Studies. Eleven potential reservoir sites in the Arkansas River basin were evaluated regarding their potential for municipal and industrial (M&I) water supply. Water quality data from the general vicinity of each site were retrieved via the Environmental Protection Agency's STORET computerized database.

(5) Tenkiller Lake, OK. Environmental Resources Branch completed a final report on results of water quality sampling at Tenkiller Lake, Oklahoma. This study was initiated in response to growing public concern about eutrophication of Tenkiller Lake. The investigation revealed significant problems with nutrient inputs, decreased water clarity, and nuisance algal blooms. Further studies at Tenkiller Lake are planned for FY 1989.

(6) Releases of 50 cubic feet per second (cfs) were made

through one of the flood conduits at Denison Dam-Lake Texoma from 5 August 1988 through 5 October 1988 to alleviate a low dissolved oxygen problem in the stilling basin. Also, a special release of 140 cfs was made through the spillway sluice gate at Broken Bow on 21 and 22 August 1988. This release was made at the request of the Oklahoma Department of Wildlife Conservation to aid them in developing a trout fishery below Broken Bow Dam. A special release was made from Waurika in May and June to alleviate fish kill problems in the stilling basin.

4. SEDIMENT PROGRAM AND ACTIVITIES.

a. ALBUQUERQUE DISTRICT. A sediment survey (aerial) of Two Rivers Reservoir was completed this year. The new area-capacity table will be ready for adoption by 1 Jan 89. The sedimentation survey report is scheduled to be completed in 1989.

b. FORT WORTH DISTRICT. Following the sedimentation resurvey of Stillhouse Hollow Lake in December 1987, a sedimentation resurvey report of Stillhouse Hollow Lake was completed and submitted to SWD in October 1988 for review and approval. For FY 1989, no projects in the Fort Worth District are scheduled for resurvey as funds requested for sedimentation resurveys in FY 1989 were not approved.

c. GALVESTON DISTRICT. A sediment policy was established in 1985 by the District to provide guidance relative to settling basins or alternative control methods on inflowing streams to reduce velocity and essentially preclude the permanent deposition of sediment in the federally-owned lands of Addicks and Barker Reservoirs. Enforcement of this policy continues, there have been no other sediment activities in FY 88. Dredging activities for FY 87 and FY 88 are shown in the following Table.

GALVESTON DISTRICT - DREDGING NAVIGATION PROJECTS (Cubic Yards)

<u>Project</u>	<u>FY 87</u>	<u>FY 88</u>
Brazos Island Harbor	1,169,359	- - - -
Channel to Port Bolivar	36,289	- - - -
Corpus Christi Ship Channel	2,481,588	* 6,117,053
Freeport Harbor	1,300,305	1,687,918
Galveston Harbor & Channel	675,549	- - - -
Houston Ship Channel	4,502,058	* 272,800
Matagorda Ship Channel	2,464,282	2,625,072
Sabine - Neches Waterway	6,719,213	* 3,165,031
Mouth of the Colorado River	- - - -	* 522,000
Trinity River and Tributaries	395,628	172,886
Texas City Channel	948,267	122,764
Double Bayou	<u>331,227</u>	<u>---</u>
SUBTOTALS	21,023,765	14,685,524
GIWW		
Sabine River to Galveston	324,372	797,042
Galveston to Corpus Christi	7,247,974	2,485,795

Corpus Christi to Mexican Border	3,531,662	1,792,204
SUBTOTALS	11,104,008	5,075,041
TOTALS	32,127,773	19,760,565

* Preliminary data subject to revision.

d. LITTLE ROCK DISTRICT.

(1) Summary of Activities. Suspended sediment samples are collected at 16 stations. The 247 sediment ranges on the main stem of the Arkansas River are re-surveyed as near annually as funds and survey workload permit. From October 1987 through September 1988, there were 185 ranges scheduled for resurveying; no resurveys were accomplished. There are 143 ranges scheduled to be resurveyed in FY 89. 56 tributary ranges are resurveyed less frequently when appreciable deposits are suspected. About 50 index ranges out of 350 sediment ranges in the other 8 reservoirs are resurveyed at 10-year intervals. During the period from October 1987 through September 1988, none were resurveyed. Index ranges are scheduled to be resurveyed at 12 reservoirs during FY 89.

(2) White River Entrance Channel Model. The entrance channel model is a physical, movable bed, hydraulic model which has been constructed at the Waterways Experiment Station (WES) to study the navigation depth problems which occur on the White River between its confluence with the Mississippi River and Lock and Dam No. 1. This reach of the White River serves as the entrance to the Arkansas River Navigation System. Design of the model began in November 1981 and construction was completed in September 1983. Adjustments and verification tests were completed in September 1983. Tests with additional contraction works were completed in August 1984. A sediment trap plan was tested but did not provide an acceptable navigation channel. Tests diverting Arkansas River flow into the entrance channel have been completed. This improved the navigation channel but did not provide a reliable channel. Tests of a lock and dam at White River Mile 0.5 were initiated in August 1985. The tests indicate that the lock and dam will improve navigation for the low flow, low stage periods. Studies are underway to determine the economic feasibility of a solution.

(3) Channel Maintenance. Maintenance dredging to maintain navigable depths amounted to approximately 5.8 million cubic yards in FY 88. For the river system this was an overall increase of about 2.0 million cubic yards from the FY 87 dredging requirements. Dredging was performed in Pools 2 and 3 and the White River Entrance Channel (WREC). Approximately 1.2 million cubic yards were dredged in the Arkansas River, 96 percent of which was from Pool 2, and approximately 4.6 million cubic yards in the WREC. Approximately 1.2 million cubic yards was dredged in the WREC during the low water season from October through December 1987 and 3.4 million cubic yards was dredged during the drought from May through September 1988. Shoals downstream of Lock Numbers 3, 4, 5, 7, 8, and 13 and at the Benzol Bridge (Navigation Mile 7.6) were removed by the Corps-operated Arkansas River Fleet

with two clam dredges operated by the Resident Offices. Approximately ten groundings exceeding one hour each occurred on the navigation system in FY 88.

e. TULSA DISTRICT. During FY 1988, a detailed reconnaissance resurvey was conducted on Elk City Lake, Kansas, and a contract was awarded to perform a detailed resurvey of Keystone Lake, Oklahoma, of all sediment ranges in the lake and 18 of the 26 degradation ranges. This resurvey is being performed due to the results of the unexpectedly high sediment deposition that was detected from the FY 1987 reconnaissance resurvey. The new hydrographic survey system installed on the survey vessel TD 8504 was installed in March 1988 and ongoing revisions to the software are currently being made by the manufacturer. This effort should be completed within the next 6 weeks.

Sediment forecasting is still a major effort to be performed, but due to other work priorities this effort has been stalled. Sediment estimates are now being computed for small reservoirs with drainage areas of about 10 square miles. New procedures for evaluating these reservoirs are being developed. The transfer of data from the Honeywell computer at the Division Office to the Tulsa District Harris computer is going to extend into late FY 1989. Suspended sediment samples were collected by the U. S. Geological Survey at 39 sites.

During FY 1988, hydrographic surveys were conducted on Stillhouse Hollow Lake, Texas, for Fort Worth District and on Pennington Creek (an arm of Lake Texoma) near Tishomingo, Oklahoma. Sediment data was collected and processed in the upper Little Arkansas River for the Survey Report and Environmental Impact Statements. A contract was awarded and completed to process the results of the sediment survey of Hugo Lake, Oklahoma. This effort presented positive results and another contract has been awarded for similar data processing for Kaw Lake, Oklahoma.

5. NAVIGATION ACTIVITIES.

a. ALBUQUERQUE DISTRICT. N/A

b. FORT WORTH DISTRICT. N/A

c. GALVESTON DISTRICT. Consolidated statement of tonnage handled by ports and moving on the Gulf Intracoastal Waterway is shown in the following table for calendar years 1985 and 1986.

	(SHORT TONS)	
	CALENDAR YEAR 1985	CALENDAR YEAR 1986
1. Brownsville, Texas	1,442,790	1,212,743
2. Port Isabel, Texas	279,578	291,713
3. Corpus Christi, Texas (6*)	41,057,313	50,104,579
4. Freeport, Texas (35*)	12,918,289	13,370,117
5. Galveston, Texas	7,791,729	7,987,857

6. Houston, Texas (3*)	90,669,169	101,659,064
7. Texas City, Texas (13*)	33,440,917	35,479,909
8. Sabine Pass Harbor, Texas	547,160	385,202
9. Port Arthur, Texas (26*)	15,754,931	18,879,546
10. Beaumont, Texas (19*)	26,842,008	27,453,660
11. Orange, Texas	648,350	661,570
12. Port Lavaca-Point Comfort	4,365,748	4,858,515
13. Anahuac, Texas	52,859	48,662
14. Clear Creek, Texas	----	----
15. Channel to Liberty, Texas	58,486	43,930
16. Double Bayou, Texas	20,845	14,145
17. Cedar Bayou, Texas	218,608	275,900
18. Colorado River, Texas	480,181	571,818
19. Sweeny, Texas	519,417	324,528
20. Palacios, Texas	10,116	- - -
21. Dickinson, Texas	194,932	330,172
22. Aransas Pass, Texas	9,649	293,681
23. Port Mansfield, Texas	204,007	3,883
24. Harlingen, Texas	692,170	668,733
25. Channel to Victoria, Texas	3,414,087	3,078,476
26. Chocolate Bayou, Texas	4,076,999	2,874,357
27. Johnsons Bayou	<u>248,959</u>	<u>329,759</u>
TOTAL	245,959,297	271,202,514

Gulf Intracoastal Waterway, Texas:
(Traffic on Waterway)

Sec. 1. (Sabine River to Galveston)	42,443,030	47,401,050
Sec. 2. (Galveston to Corpus Christi)	22,937,710	23,809,550
Sec. 3. (Corpus Christi to Mexican Border)	<u>2,128,564</u>	<u>1,723,040</u>
TOTAL (1)	67,509,304	72,933,640

(*National Port Ranking - 1986)

(1) Includes duplications.

d. LITTLE ROCK DISTRICT. Record low stages on the Mississippi River during the drought this past summer caused extremely low stages on the White River Entrance Channel (WREC). In June, a grounded tow blocked the WREC causing the channel to be closed for two days. Upon reopening, tows were restricted to 70 feet wide by 600 feet long (including towboat) and restricted to daylight usage with a Corps of Engineers escort boat. The tow size and draft restrictions remained in effect through the end of September. For approximately one week during June a minimum draft restriction of 7 feet was imposed.

Projections indicate that about 8.0 million tons of commerce will be moved on the McClellan-Kerr Arkansas River Navigation System in CY 88. This represents a decrease of 10 percent from the CY 87 level. Commodities moved consisted of iron and steel, chemicals and chemical fertilizers, petroleum products, coal, sand and gravel, rock, soybeans, wheat and other grains, and miscellaneous commodities. Inbound movements are predicted to decrease by 2 percent and outbound movements to decrease by 11 percent.

e. TULSA DISTRICT. Commercial movements in Oklahoma for FY 1988 were within one percent of the tonnages moved in FY 1987. Navigation conditions were far from ideal with high flows occurring in the winter and spring months followed abruptly by the drought of the summer. Wheat, chemical fertilizer, iron and steel, and petroleum products are the leading commodities shipped. Movements of military equipment have increased steadily. The following table provides the total tonnage for both the Little Rock and Tulsa Districts.

MCCLELLAN-KERR ARKANSAS RIVER NAVIGATION SYSTEM
(Total Tonnage Little Rock and Tulsa Districts)

	1987 * (Tons)	1988 ** (Tons)
Inbound	2,131,022	2,096,000
Outbound	3,348,218	2,980,000
Internal	2,751,562	2,352,000
Through	<u>654,637</u>	<u>572,000</u>
Totals	8,885,439	8,000,000

* Unofficial figures

** Projected figures

6. COOPERATIVE PROGRAMS.

a. ALBUQUERQUE DISTRICT.

1. National Weather Service. Albuquerque District does not have a cooperative program with the National Weather Service to support rainfall gages.

2. U.S. Geological Survey. The cooperative stream gaging program with the U.S. Geological Survey covered 44 stations in FY 88. Total program cost was \$200,870, as shown in Table VI-7. The following is a summary of number of stations by river basin.

STATION SUMMARY

STATIONS

<u>BASIN</u>	<u>STREAM</u>	<u>RESERVOIR</u>	<u>TOTAL</u>
Arkansas	5	2	7
Canadian	3	2	5
Rio Grande	11	8	19
Pecos	9	4	13

Note: 6 gages are not associated with project operation.

b. FORT WORTH DISTRICT.

(1) National Weather Service.

Funds were transferred by CESWF to the NWS in the amount of \$89,519 for FY 1988. Under ongoing programs, the Corps collects rainfall at project offices while the NWS collects all other rainfall reports and maintains weather stations, including those at Corps' projects. Rainfall summaries are transmitted to the Corps via telephone and a daily computer printed map which displays current totals for reporting stations. supplemental and accumulative storm total printouts are provided upon request. Additional hydrometeorological information was received from the NWS via AFOS. Radar scans were obtained on a Kavouras radar acquisition access and display terminal via a direct connection to the NWS Stephenville radar site (which covers the geographic area where the majority of the District's projects are concentrated) and via commercial long-distance telephone into NWS radar sites at Galveston, Hondo, and Brownsville, Texas, and into Oklahoma City, Oklahoma. Continuous updates are possible during storm periods.

(2) U. S. Geological Survey.

a. General.

The USGS performed, maintained, and operated all streamflow, lake level, and some water quality stations in cooperation with the Fort Worth District. They arranged for reporting at river stages during flood events, made supplemental flow measurements, and processed all published data. In addition to the cooperative streamgaging program the USGS under memorandum of agreement provide operation and maintenance service to the Fort Worth District Data Collection Platform network.

b. Funds.

The Fort Worth District transferred to the USGS, for the Cooperative Streamgaging Program, \$663,460 for FY 1988 to support 135 gages as shown in Table VI-8

c. GALVESTON DISTRICT.

(1) National Weather Service - The cooperative program with the NWS provides for the operation and maintenance of precipitation gages and for the transmission of rainfall summaries via teletype circuits. The total program cost for FY 1988 was \$6,972 as shown in Table VI-9. The total program cost for FY 1989 will be \$7,126.

(2) U. S. Geological Survey - Two cooperative programs are currently in existence with the USGS. One provides the operation and maintenance of stream gages and the second provides the operation and minor maintenance for Data Collection Platforms. The total program cost for FY 1988 was \$159,230. The total program cost for FY 1989 will be \$165,770. total program cost for

FY 1989 will be \$7,126.

d. LITTLE ROCK DISTRICT. Approximately 202 rainfall and/or river stage reporting stations were operated by the National Weather Service and the Corps of Engineers in or near the Little Rock District. Of these, 117 stations are in the Corps of Engineers/National Weather Service program. The remaining 85 stations are operated solely by the National Weather Service within or near the Little Rock District. Six of these stations are airway stations that report at 6-hour intervals. Reports from these stations are used in forecasting streamflows for flood warnings and operation of reservoir projects. The FY 88 total cost for this program was \$37,340. The FY 89 cost is projected to be approximately \$39,000.

(2) U.S. Geological Survey

The streamgaging data required by the District is collected under a cooperative agreement with the USGS. During the fiscal year 110 stations were operated. Of these, 74 were operated cooperatively and 36 were operated by the Corps of Engineers. The FY88 total cost for collection of streamflow and sediment data was \$531,850 of which \$393,870 was transferred to the USGS as shown in Table VI-10. The FY89 cooperative program cost is \$562,050 of which \$398,340 will be transferred to USGS.

e. TULSA DISTRICT.

(1) National Weather Service. Real-time water control and investigation and design of our water resources projects requires the measurement and reporting of rainfall and evaporation data. These data are provided through a cooperative program with the National Weather Service. During FY 1988, the rainfall and evaporation program in the Tulsa District cost \$131,023 through transfer of funds to the National Weather Service.

(2) U.S. Geological Survey. Much of the information required for water control, hydrologic investigation, and design of water resources projects results from the reporting and measurement of flow, water quality, and sediment provided by a cooperative stream gaging program with the USGS. During FY 1988, this cooperative program included 196 stations, six of which were operated independently by the Corps of Engineers. The stream gaging program in the Tulsa District cost \$1,862,433 in FY 1988 with \$980,740 of this being transferred to the USGS for operation of stations and data publications as shown in Table VI-11. The total CE/USGS program cost for FY 1989 will be \$1,058,680.

7. ANNUAL FLOOD DAMAGES PER RIVER BASIN PREVENTED BY BOTH CORPS AND SECTION 7 PROJECTS

a. ALBUQUERQUE DISTRICT. The following is a listing of damages prevented by Corps and Section 7 reservoir projects during FY88. Total damages prevented in FY 88 are \$2,000.

Damages Prevented in Thousands of Dollars

<u>Basin</u>	<u>Project</u>	<u>FY 88 Damages Prevented</u>	<u>Cumulative Benefits Through FY 88</u>
Arkansas	John Martin	0	87,609
	Pueblo	0	2,852
	Trinidad	0	0
Canadian	Conchas	0	81
Rio Grande	Abiquiu	2	229,340
	Cochiti	0	249,834
	Galisteo	0	0
	Jemez Canyon	0	10,639
	Platoro	0	4,508
	Rio Grande Fldw.	536	44,011
	Alb. Div. Channel	20,990	77,774
	Santa Rosa	0	7
	Sumner	0	0
	Two Rivers	0	6,862
	Brantley	0	0
San Juan	Navajo	0	50
	TOTAL	21,528	713,567

b. FORT WORTH DISTRICT. Annual flood damages prevented by river basin and project for both Corps' and Section 7 lakes are shown in Table VI-I. The table presents the damages prevented for both FY 1988 and cumulative through FY 1988.

TABLE VI-I
FLOOD DAMAGES PREVENTED BY PROJECTS
FISCAL YEAR 1988

<u>PROJECT</u>	<u>FY88 DAMAGES PREVENTED (in \$1,000's)</u>	<u>CUMULATIVE BENEFITS THROUGH FY88 (in \$1,000's)</u>
<u>BRAZOS RIVER BASIN</u>		
Aquilla	\$ 0.0	\$ 1,234.0
Belton	462.2	118,597.7
Georgetown	4.1	4,610.2
Granger	68.1	14,484.2
Proctor	1,011.9	8,733.3
Somerville	0.0	32,194.0
Stillhouse	54.7	25,360.9
Waco	0.0	60,053.9
Whitney	0.0	134,777.0
Subtotal	\$1,601.0	\$400,045.2
<u>COLORADO RIVER BASIN</u>		
Hords Creek	\$0.0	\$ 937.0
O. C. Fisher	0.0	2,375.6
Subtotal	\$0.0	\$ 3,312.6

GUADALUPE-SAN ANTONIO RIVER BASIN

Canyon	\$0.0	\$ 58,878.3
San Antonio	0.0	<u>117,514.9</u>
Subtotal	\$0.0	\$176,393.2

NECHES RIVER BASIN

Sam Rayburn	\$2,761.3	\$ 130,255.7
Subtotal	\$2,761.3	\$ 130,255.7

RED RIVER BASIN

Lake O' The Pines	\$ 497.6	\$ 6,636.0
Wright Patman	<u>162.4</u>	<u>13,859.4</u>
Subtotal	\$ 660.0	\$ 20,495.4

TRINITY RIVER BASIN

Bardwell	\$ 0.0	\$ 9,112.7
Benbrook 1/	0.0	51,449.4
Big Fossil	0.0	6,322.6
Grapevine 2/	481.9	943,202.2
Joe Pool	0.0	1,764.8
Lavon	0.0	91,035.1
Navarro Mills	<u>0.0</u>	<u>27,732.0</u>
Subtotal	\$ 481.9	\$1,130,619.0

Grand Total	\$5,504.2	\$1,861,121.1
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COLORADO RIVER BASIN 3/

Marshall Ford	\$ 522.2	\$191,415.6
Twin Buttes	<u>0.0</u>	<u>418.0</u>
Subtotal	\$ 522.2	\$191,833.6

Grand Total	\$6,026.4	\$2,052,954.7
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- 1/ Includes Fort Worth Floodway System
 2/ Includes Lewisville and Dallas Floodway System
 3/ Built by Bureau of Reclamation but under Corps
 Corps Flood Control Jurisdiction

c. GALVESTON DISTRICT. Damages prevented for river and stream projects were impacted by the near drought conditions of FY 1988. There were no flood damages prevented in Galveston District during FY 88. The cumulative total of flood damages prevented at the Addicks and Barker projects is \$161,754,000. The cumulative total of flood damages prevented for all Corps projects in the District is \$828,266,000.

	Flood Damages Total for FY 88	Prevented (\$000) Cumulative Total
Addicks and Barker 1/	0	161,754
Brays Bayou	0	208,677
White Oak Bayou	0	20,917
Lavaca-Navidad Rivers	0	637

Tranquitas Creek	0	5,333
San Diego Creek	0	2,908
Texas City, Texas (Hurricane-Flood)	0	10,614
Torado River, Matagorda	0	844
Galveston Seawall	0	400,000
Vince Bayou	0	2,582
Port Arthur (Hurricane-Flood)	0	6,000
Freeport (Hurricane-Flood and Tide Gate)	0	8,000
Nueces River (Three Rivers)	0	0
Total	0	828,266

1/ Piney Point Gage-Flood Stage 50.0 feet (NGVD).

a. LITTLE ROCK DISTRICT. The annual flood damages prevented by river basins during FY 88 in the Little Rock District are shown in the following table and amount to \$19,081,000.

<u>Basin</u>	<u>FY 88 Damages Prevented</u>	<u>Cumulative Through FY 1988</u>
Arkansas River	\$ 5,933,000	\$315,575,000
White River	12,635,000	342,918,000
Little River	<u>523,000</u>	<u>19,353,000</u>
TOTALS FY 88	\$ 19,081,000	\$677,836,000

e. TULSA DISTRICT. Flood damages prevented by the Tulsa District Lakes in the Arkansas and Red River Basins during FY 1988 are shown in the following table and amount to \$142,144,000.

<u>ARKANSAS RIVER BASIN</u>	<u>FY 1988</u>	<u>CUMULATIVE THROUGH FY 1988</u>
Arcadia	----	1,065,000
Big Hill	66,000	441,000
Birch	1,576,000	8,878,000
Canton	275,000	8,346,000
Cheney	228,000	14,164,000
Copan	11,394,000	104,985,000
Council Grove	305,000	17,757,000
El Dorado	897,000	15,235,000
Elk City	4,780,000	55,587,000
Eufaula	11,209,000	71,014,000
Fall River	3,421,000	42,686,000
Fort Gibson	2,542,000	46,852,000
Fort Supply	3,000	3,169,000
Great Salt Plains	2,194,000	39,641,000
Heyburn	234,000	7,681,000
Hulah	20,746,000	220,025,000
Iola	1,520,000	14,197,000
John Redmond	5,921,000	86,739,000

Jenks	318,000	2,618,000
Kaw	9,913,000	266,449,000
Keystone	15,580,000	410,194,000
Marion	1,545,000	37,689,000
Markham Ferry	580,000	8,513,000
Norman	990,000	12,516,000
Oolagah	11,988,000	93,304,000
Optima		11,000
Pensacola	2,196,000	49,384,000
Sanford	----	162,000
Skiatook	7,197,000	39,201,000
Tenkiller	2,642,000	17,953,000
Toronto	4,949,000	43,092,000
Tulsa & West Tulsa	2,826,000	261,372,000
Wister	<u>9,005,000</u>	<u>84,877,000</u>
Total Arkansas Basin	137,038,000	2,085,785,000

RED RIVER BASIN

Altus	966,000	4,729,000
Arbuckle		452,000
Broken	203,000	15,737,000
Denison	85,000	64,581,000
Fort Cobb	46,000	733,000
Foss	22,000	2,811,000
Hugo	357,000	8,286,000
Lake Kemp	----	3,170,000
Mountain Park	20,000	619,000
Pat Mayse	134,000	4,325,000
Pine Creek	1,206,000	12,860,000
Sardis	977,000	6,599,000
Waurika	<u>1,090,000</u>	<u>22,275,000</u>
Total Red River Basin	5,106,000	147,178,000
Grand Total	142,144,000	2,232,963,000

8. ANNUAL FLOOD DAMAGES BY STATE PREVENTED BY CORPS PROJECTS

a. ALBUQUERQUE DISTRICT

<u>State</u>	<u>Damages Prevented</u> <u>In Thousands of Dollars</u>
Colorado	0
New Mexico	* 21,528
Kansas	0

* Primarily the Albuquerque North Diversion channel (Local Protection Project)

b. FORT WORTH DISTRICT. Flood damages prevented by Corps projects during FY 1988 in the state of Texas were \$6,026,400.

c. GALVESTON DISTRICT. There were no flood damages prevented by Corps projects in the state of Texas during FY 1988.

d. LITTLE ROCK DISTRICT. The annual flood damages prevented in each state served by the Little Rock District during FY 88 is shown in the following table:

<u>State</u>	<u>FY 88 Damages Prevented</u>
<u>Arkansas</u>	
Levees, Arkansas River (Little Rock District)	\$ 5,345,000
Reservoirs, Arkansas River (Little Rock District)	578,000
Levees, White River (Little Rock District)	2,493,000
Reservoirs, White River (Little Rock District)	8,874,000
Reservoirs, Little River (Little Rock District)	523,000
Arkansas Total	\$ 17,813,000
<u>Missouri</u>	
Levees, White River (Little Rock District)	2,000
Reservoirs, White River (Little Rock District)	<u>1,266,000</u>
Missouri Total	1,268,000
TOTAL DAMAGES PREVENTED FOR FY 88	\$ 19,081,000

e. TULSA DISTRICT. Annual flood damages prevented in FY 88 by Corps projects in FY 1988 for the state of Kansas amounted to \$16,712,000; for Oklahoma, \$109,979,999; for Arkansas, \$15,542,000; and for Texas, \$219,000.

9. ANNUAL FLOOD DAMAGES BY STATE PREVENTED BY CORPS SUPPORTED EMERGENCY OPERATIONS.

- a. ALBUQUERQUE DISTRICT. None
- b. FORT WORTH DISTRICT. None
- c. GALVESTON DISTRICT. None

d. LITTLE ROCK DISTRICT. The flood damages prevented in FY88 by Emergency Operations occurred primarily over the Christmas holiday weekend along the Arkansas River and upper Black River basins. Little Rock District (LRD) received widespread heavy rains of over 10 inches in many locations which caused severe flash flooding and localized high water in most streams along the Arkansas River and upper Black River basins. LRD assisted the city of Shannon Hills in preventing 7 homes from being flooded in the vicinity of the Otter Creek Channel Improvement Project. Hydraulics, Emergency Management and Navigation Branch personnel monitored flood threats, notified navigation interests, coordinated with levee officials, and coordinated with state and local emergency officials and analyzed flood damages throughout the holiday weekend. Contact was maintained with the Tulsa

District concerning releases into the Arkansas River and its effects on localized flooding. Timely decisions were made and damages were minimized. Field Office personnel from Clearwater Lake monitored the rising Black River in the vicinity of Poplar Bluff, Missouri and patrolled critical areas. The North Inter-River Levees were watched for possible problems. No pumping operations had to be conducted since crops had been harvested. There were no appreciable cost savings in Missouri. Flood damages prevented in Arkansas are as follows:

<u>Location</u>	<u>Description</u>	<u>Damages Prevented</u>
Arkansas River	Loose barge rescued	\$50,000 (barge) \$100,000 (lock)
City of Shannon Hills	7 homes protected by sandbag operations	\$140,000
Arkansas River	navigation warnings	\$100,000
Total Damages Prevented		\$390,000
Total Cost of Emergency Operations		\$2,470

e. TULSA DISTRICT. Not available.

10. HYDROPOWER PRODUCTION.

a. ALBUQUERQUE DISTRICT. N/A.

b. FORT WORTH DISTRICT. Hydropower production by project for Fiscal Years 1984 through 1988 is shown in Table VI-2.

TABLE VI-2

<u>Project</u>	<u>Gross Generation</u> <u>----- (MWH) -----</u>	<u>Fiscal</u> <u>Year</u>
Sam Rayburn	110,577	1988
	147,319	1987
	106,726	1986
	97,971	1985
	125,477	1984
Whitney	18,152	1988
	110,216	1987
	51,900	1986
	57,529	1985
	14,364	1984

c. GALVESTON DISTRICT. N/A

d. LITTLE ROCK DISTRICT. The annual hydropower production at LRD plants in total GWH by fiscal year is shown in the following tabulation.

<u>Project</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>
Beaver	117.8	224.1	215.8	156.6	192.4
Table Rock	473.5	888.3	648.2	434.7	636.3
Bull Shoals	702.5	1402.9	880.5	572.2	897.2
Norfolk	211.1	397.3	215.9	127.8	223.9
Greers Ferry	160.0	317.3	150.6	106.9	201.8
Ozark	195.9	439.9	490.6	343.9	334.6
Dardanelle	<u>599.0</u>	<u>826.9</u>	<u>802.8</u>	<u>833.3</u>	<u>601.8</u>
Totals(GWH)	2459.8	4496.7	3404.4	2575.4	3088.0

e. TULSA DISTRICT. Hydropower generation at Tulsa District projects for FY 1984 through 1988 is shown in the following tabulation.

HYDROPOWER PRODUCTION
FOR TULSA DISTRICT PROJECTS

NET ANNUAL GENERATION (GWH)

<u>PROJECT</u>	<u>FY</u> <u>1984</u>	<u>FY</u> <u>1985</u>	<u>FY</u> <u>1986</u>	<u>FY</u> <u>1987</u>	<u>FY</u> <u>1988</u>
Denison	199	343	295	533	193
Broken Bow	140	230	147	88	107
Sub-Total	339	573	442	621	300
Keystone	234	307	333	501	180
Fort Gibson	204	322	295	288	138
Webbers Falls	190	321	351	287	103
Tenkiller Ferry	78	176	172	148	75
Eufaula	195	360	336	461	198
Robert S. Kerr	<u>526</u>	<u>751</u>	<u>726</u>	<u>773</u>	<u>371</u>
Sub-Total	1,427	2,237	2,213	2,458	1,065
Total	1,776	2,810	2,655	3,079	1,365

11. LAKE ATTENDANCE.

a. ALBUQUERQUE DISTRICT. The following is a listing of attendance at Corps and Section 7 projects in the Albuquerque District.

Project Attendance in Thousands

Year

<u>Project</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>
----------------	-------------	-------------	-------------	-------------	-------------

Abiquiu	331.9	331.9	571.4	406.5	512.3
Cochiti	519.5	716.6	978.1	819.7	867.2
Conchas	331.9	449.7	586.7	408.8	625.0
Galisteo	5.1	7.6	8.3	5.8	5.9
Jemez Canyon	44.9	51.0	53.5	53.3	58.9
John Martin	698.9	742.5	702.9	1,012.7	754.3
Santa Rosa	240.8	248.2	233.3	191.6	156.1
Trinidad	164.9	275.4	274.3	282.1	395.9
Two Rivers	11.6	62.7	17.6	13.2	11.3
Pueblo	906.8	1,335.4	1,509.1	1,476.5	1,365.1
Platoro	21.5	17.4	13.2	8.4	8.8
Sumner	137.7	129.7	138.3	95.5	106.2
Navajo	485.1	486.2	527.6	417.0	*479.0

* Estimate

b. FORT WORTH DISTRICT. Lake attendance for both the Fort Worth District Corps' lakes and the Section 7 lakes is presented in Table VI-3. The attendance is presented for the period FY 1984 through FY 1988.

TABLE VI-3

PROJECT ATTENDANCE IN THOUSAND

<u>PROJECT</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>
Aquilla	26.6	100.4	104.1	105.0	106.1
Bardwell	974.8	984.7	769.6	780.0	801.0
Belton	2,355.3	2,307.5	2,504.1	2,600.0	2,701.0
Benbrook	3,083.4	2,504.1	2,584.6	2,700.0	2,570.0
Canyon	2,327.0	2,316.8	2,429.2	2,000.0	2,170.0
Georgetown	889.4	1,064.7	970.5	800.0	950.0
Granger	256.1	322.1	325.6	340.0	350.0
Grapevine	4,932.2	4,315.3	4,077.7	4,200.0	4,450.0
Hords Creek	805.9	578.0	437.0	450.0	600.0
Joe Pool	- -	- -	- -	2.0	3.0
Lake O'					
The Pines	3,116.1	2,392.2	2,434.8	2,400.0	2,750.0
Lavon	3,121.1	4,072.5	3,652.9	3,700.0	3,950.0
Lewisville	6,482.0	5,752.4	7,204.3	7,300.0	6,990.0
Navarro Mills	1,371.0	1,540.5	1,319.5	1,400.0	1,450.0
O. C. Fisher	1,328.9	787.3	534.7	550.0	610.0
Proctor	916.1	962.7	928.2	940.0	965.0
Ray Roberts	- -	- -	- -	1.0	2.0
Sam Rayburn	3,094.3	3,258.3	3,319.6	3,400.0	3,550.0
Somerville	2,057.8	1,639.8	1,380.0	1,400.0	1,460.0
Stillhouse	987.3	915.2	1,206.3	1,300.0	1,250.0
Town Bluff	627.9	707.7	589.2	600.0	625.0
Waco	4,683.3	4,599.9	4,891.2	4,900.0	4,875.0
Whitney	2,056.1	2,249.7	2,350.2	3,400.0	2,750.0
Wright Patman	2,220.9	2,320.3	3,072.6	3,100.0	2,990.0
Marshall Ford		NOT AVAILABLE			
Twin Buttes		NOT AVAILABLE			

c. GALVESTON DISTRICT. N/A

d. LITTLE ROCK DISTRICT. Annual lake attendance at all LRD projects in visitor days by calendar year is shown in the following table:

1984 - 42,137,000
 1985 - 42,700,000
 1986 - 44,128,000
 1987 - 47,000,000
 1988 - 49,500,000 (estimated) *

* equals 187,720,749 visitor hours (as now being reported)

e. TULSA DISTRICT. Lake attendance figures for calendar years 1984 through August 1988 are tabulated in Table VI-4. Official visitation figures have recently been converted to a visitor hour basis (estimated number of hours spent by all visitors to the project). 1984 and 1985 figures are shown in recreation days (estimated number of persons visiting the project for any length of time). 1986 figures are shown in both visitor hours and recreation days of use, and 1987 and 1988 figures are shown in the visitor hours only.

12. WATER SUPPLY STORAGE.

a. ALBUQUERQUE DISTRICT. Cochiti, Galisteo, Jemez Canyon and Two Rivers projects do not have storage allocated for water supply. The following table is a listing of reservoirs with space allocated.

Storage in Thousands of Acre-Feet

<u>Project</u>	<u>Storage Allocated</u>	<u>Amount Contracted</u>	<u>Number of Contact</u>	<u>Water Supplied FY 87</u>	<u>FY 88</u>
Conchas	254	0	0	40.1	32.7
John Martin	345	0	0	149.1	213.1
Santa Rosa	200	0	0	31.0	57.8
Trinidad	20	0	0	17.8	35.3
Abiquiu	200	170.9	1	0	0

b. FORT WORTH DISTRICT. Water supply information by project is shown in Table VI-5

TABLE VI-5

<u>Project Name</u>	<u>Storage Contracted (AC-FT)</u>	<u>Storage Allocated (AC-FT)</u>	<u>Number Contracted (USERS)</u>	<u>Water Supplied In FY 88 (AC-FT)</u>
---------------------	---	--	--	--

Aquilla Lake	33,600	52,480	1	2,400
B. A. Steinhagen Lake	1/	1/	1	1,944,200
Bardwell Lake	21,400	42,800	1	4,100
Belton Lake	372,700	372,700	2	55,200
Benbrook Lake	23,708 2/	23,708 2/	1	4,800
Canyon Lake	366,400	366,400	1	104,500
Georgetown Lake	101	29,200	1	6,700
Granger Lake	0	37,900	1	0
Grapevine Lake	161,250	161,250	3	36,300
Hords Creek Lake	5,780	5,780	1	360
Joe Pool Lake	0	142,900	1	310
Lake O' The Pines	250,000	250,000	1	12,900
Lavon Lake	220,000	220,000 3/	1	101,100
Lewisville Lake	436,000	436,000	2	155,800
Navarro Mills Lake	53,200	53,200	1	7,000
O.C. Fisher Lake	80,400	80,400	1	10,500
Proctor Lake	31,400	31,400	1	12,300
Ray Roberts	749,200	749,200	2	0
Sam Rayburn Reservoir	43,000 1/	43,000	2	0
Somerville Lake	143,900	143,900	1	15,600
Stillhouse Hollow Lake	204,900	204,900	1	66,310
Waco Lake	104,100	104,100	2	23,700
Whitney Lake	50,000	50,000	1	1,700
Wright Patman Lake	91,263	91,263	1	36,400

1/ LNVA is permitted to withdraw from B. A. Steinhagen lake not to exceed 2,000 c.f.s. This lake acts as a reregulation dam to Sam Rayburn Reservoir.

2/ Remaining 48,792 ac-ft of navigation storage is in the process of being negotiated with water user.

3/ NTMWD has given assurances for an additional 160,000 ac-ft of storage in Lavon Lake.

c. GALVESTON DISTRICT. N/A

d. LITTLE ROCK DISTRICT Water supply allocations, contracts and usages for FY87 and FY88 are shown by project in the following table:

Project	Amount of Storage Allocated (AC-Ft)	Amount of Storage Contracted (AC-Ft)	Number of Contracts	Amount Supplied (AC-Ft)	
				FY87	FY88
Beaver	117,000	40,000	2	31,165	34,084
Norfork	2,400	2,400	1	2,430	2,624
Greers Ferry	3,215	1,125	3	1,856	1,870
Nimrod	33	33	1	92	87
DeQueen	17,900	0	0	0	0
Gillham	20,600	123	1	661	627
Dierks	10,100	190	1	246	254
Millwood	150,000	32,828	1	53,944	54,187

e. TULSA DISTRICT. Storage allocated to water supply totals 3,840,240 acre-feet in the Tulsa District. The Corps has 2,115,220 acre-feet in 30 projects while the Section 7 projects totaled 1,725,020 acre-feet in 11 projects. The following table (V-6) is a project listing showing water supply storage, yield, amount contracted, number of contracts (existing and pending), and usage.

TABLE VI-4
TULSA DISTRICT
ATTENDANCE AT CORPS OF ENGINEERS
PROJECTS (IN THOUSANDS)

PROJECT	1984 rec. days	1985 rec. days	1986 rec. days	1986 Visitor hours	1987 Visitor hours	1988* Visitor hours
Great Salt Plains	297.4	328.2	432.9	6059.2	7204.0	5263.0
Fort Supply	898.7	860.5	729.5	4295.4	8903.0	7361.0
Canton	2738.1	2625.0	2706.1	24764.0	33595.0	29102.0
Hulah	428.7	357.7	337.8	1634.3	3818.0	1214.0
Tenkiller	2065.1	2182.0	2379.1	42435.4	49419.0	46979.0
Wister	971.1	838.2	771.6	7752.6	10785.0	15314.0
Keystone	2627.3	3262.6	3240.9	6399.9	14634.0	10065.0
Oologah	3003.4	2837.1	2300.0	23031.6	21436.0	18888.0
Fort Gibson	3881.8	4933.9	4493.7	62783.8	77190.0	43647.0
Fall River	209.7	192.5	228.3	2797.1	2241.0	2154.0
Toronto	145.6	161.9	197.2	4357.0	3511.0	3162.0
Elk City	253.1	281.2	280.2	7886.3	3508.0	2392.0
Optima	178.1	141.1	131.4	421.2	346.0	195.0
Pat Mayse	370.1	386.8	456.9	3753.9	3768.0	2223.0
Eufaula	4162.5	4607.3	4154.5	57851.1	70942.0	60647.0
Heyburn	275.0	280.2	269.8	1847.4	1893.0	2238.0
Hugo	937.3	917.2	846.4	4472.0	5746.0	3470.0
Texoma	8342.3	8683.5	8479.1	141609.5	179969.0	107550.0
Waurika	850.3	829.6	843.3	4495.3	5163.0	10936.0
John Redmond	313.5	242.0	296.2	1654.4	1915.0	1350.0
Council Grove	512.0	473.9	473.2	7801.4	8769.0	8599.0
Broken Bow	861.0	949.2	906.3	25638.7	26556.0	17462.0
Marion	235.3	325.1	317.0	5280.9	5793.0	4292.0
Pine Creek	847.9	849.7	983.7	11949.7	7285.0	4038.0
Robert S. Kerr	1042.9	1031.6	1128.2	5807.4	6382.0	5272.0
W.D. Mayo L&D	221.0	197.1	244.0	890.6	975.0	688.0
Chouteau L&D	421.6	373.3	348.4	3160.4	3915.0	2811.0
Newt Graham L&D	458.6	338.8	239.1	2347.6	2423.0	2114.0
Webbers Falls	942.5	1111.4	917.1	13530.2	12502.0	8635.0
Birch	343.1	241.6	246.6	1535.1	1414.0	1127.0
Kaw	1051.0	1139.0	1317.9	586.4	5599.0	11322.0
Big Hill	431.4	472.4	396.2	2047.2	2096.0	5479.0
Sardis	311.9	316.1	310.3	2215.3	1586.0	5443.0
El Dorado	503.1	525.3	772.6	958.2	7678.0	7564.0
Copan	214.4	209.4	213.8	1051.4	1873.0	203.0
Skiatook			408.8	4321.7	4097.0	3876.0
DISTRICT TOTAL	41330.0	43503.3	42390.2	509923.6	604829.0	464511.0

*Total for January through September 1988.

VI-3837a

TABLE VI - 6

WATER SUPPLY STORAGE

Corps of Engineers Projects
(October 1988)

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PROJECT	STORAGE ALLOCATED TO WATER SUPPLY AF	ESTIMATED YIELD MGD	AMOUNT CONTRACTED AF	NUMBER OF CONTRACTS		AMOUNT SUPPLIED AF	
				EXISTING	PENDING	FY 87	FY 88
<u>ARKANSAS RIVER BASIN</u>							
ARCADIA	23090	11	23090	1	0	0	2247
PEARSON-SKUBITZ BIG HILL	25700	8.5	25700	1	0	523	582
BIRCH	7630	3	0	0	0	0	0
CANTON	38000 (1)	10	0	0	0	0	36330
COPAN	7500	3	5000	1	0	94	90
COUNCIL GROVE	24400	6	24400	1	0	0	0
EL DORADO	142800	22.2	142800	1	0	7959	8052
ELK CITY	24300	10	24300	1	0	0	0
EUFULA	56000	50	11980	16	1	1055	1637
FORT GIBSON	0	0	0	0	0	14385	15758
FORT SUPPLY	400	0.2	400	1	0	137	145
HEYBURN	2000 (2)	1.7	2000	3	0	1733	1816
HULAH	19800	12.4	19800	4	0	2708	6612
JOHN REDMOND	34900	24.5	34900	1	0	217	11085

TABLE VI - 6

WATER SUPPLY STORAGE

Corps of Engineers Projects
(October 1988)

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PROJECT	STORAGE ALLOCATED TO WATER SUPPLY AF	ESTIMATED YIELD MGD	AMOUNT CONTRACTED AF	NUMBER OF CONTRACTS		AMOUNT SUPPLIED AF	
				EXISTING	PENDING	FY 87	FY 88
KAW	171200	167	90800	3	0	4347	6861
KEYSTONE	20000	20	18000	1	1	5396	5402
MARION	38300	3	38300	1	0	727	762
COLOGAH	342600	154	322390	7	1	54307	54192
OPTIMA	76200	4.5	0	0	0	0	0
SKIATOOK	62900	14	17308	5	0	0	0
TENKILLER	25400	26.6 (3)	17260	8	1	5465	4752
TORONTO	400	0.1	400	2	0	71	90
WISTER	14000	20.03	13653	3	0	1355	3685
<u>RED RIVER BASIN</u>							
BROKEN BOW	152500	175	0	0	2	0	0
HUGO	47600	58	44890	3	0	5681	5831
PAT MAYSE	109600	55	109600	1	0	13316	12488
PINE CREEK	49400	84	28800	1	0	33604	33788
SARDIS	297200	140	297200	1	0	0	0
TEXOMA (4)	150000	150	114956	5	1	120	104
WAURIKA	151400	36.2	41800	1	0	4901	5178

TABLE VI - 6
WATER SUPPLY STORAGE

Section 7 Projects
(October 1988)

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PROJECT (5)	STORAGE	AMOUNT WITHDRAWN	
	ALLOCATED TO WATER SUPPLY AF	FY 87	FY 88
<u>ARKANSAS RIVER BASIN</u>			
CHENEY	146980	27445	29345
HUDSON	0	0	0
MEREDITH	499700	64169	63426
THUNDERBIRD	105900	16212	17378
<u>RED RIVER BASIN</u>			
ALTUS	122900	41332	71546
ARBUCKLE	62570	7489	6978
FORT COBB	78350	9204	11051
FOSS	243670	1992	1987
LAKE KEMP	268000	47991	77187
MOUNTAIN PARK	88950	4210	4794
MOGEE CREEK	108000	0	8

- (1) Stet based on 1979 sedimentation survey.
- (2) Estimated storage to be available in year 2000.
- (3) Revision due to water supply yield restudy.
- (4) Joint water supply and power provided between elevation 617.0 - 590.0.
- (5) Estimated yield and contract information not available.

TABLE VI - 7

STATION SUMMARY
COOPERATIVE STREAM GAGING PROGRAM
FISCAL YEAR 1988

ALBUQUERQUE DISTRICT

GENERAL INVESTIGATIONS				CONSTRUCTION GENERAL			CORPS TOTAL	CORPS PER-CENT	PROGRAM SUPPORT
STUDIES	GEN. COV	PLAN A&SD	PROJ. CONST	OSM	WRST				
FUNDS (DOLLARS)									
GAGE CLASS - SW	0	7,600	0	188,480	0	196,080	93	211,280	
- QW	0	0	0	0	0	0	0	0	
- SB	4,790	0	0	0	0	4,790	100	4,790	
- OT	0	0	0	0	0	0	0	0	
TOTAL	4,790	7,600	0	188,480	0	200,870	93	216,070	
PERCENT	2.4	3.8	0.0	93.8	0.0	100.0			
NUMBER OF EQUIVALENT GAGES FUNDED									
GAGE CLASS - SW	0.0	1.2	0.0	39.4	0.0	40.7	95	43.0	
- QW	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	
- SB	1.0	0.0	0.0	0.0	0.0	1.0	100	1.0	
- OT	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	
TOTAL	1.0	1.2	0.0	39.4	0.0	41.7	95	44.0	

NUMBER OF GAGING STATIONS/SITES: 44

NUMBER OF GAGES FUNDED 100% BY COOP PROGRAM: 44

NOTE: INCLUDES AER FUNDS

0 DUPLICATE GAGE NUMBERS WERE FOUND

TABLE VI - 8

STATION SUMMARY
COOPERATIVE STREAM GAGING PROGRAM
FISCAL YEAR 1988

FORT WORTH DISTRICT

GENERAL INVESTIGATIONS			CONSTRUCTION GENERAL			CORP'S				
STUDIES			GEN. COV	PLAN A&SD	PROJ. CONST	OSM	MR&T	CORPS TOTAL	PER- CENT	PROGRAM SUPPORT
FUNDS (DOLLARS)										
GAGE CLASS - SW			0	0	1,110	450,000	0	451,110	94	477,970
- OW			0	0	0	212,350	0	212,350	90	236,090
- SS			0	0	0	0	0	0	0	0
- OT			0	0	0	0	0	0	0	0
TOTAL			0	0	1,110	662,350	0	663,460	93	714,060
PERCENT			0.0	0.0	0.2	99.8	0.0	100.0		
NUMBER OF EQUIVALENT GAGES FUNDED										
GAGE CLASS - SW			0.0	0.0	3.0	88.8	0.0	91.8	87	105.0
- OW			0.0	0.0	0.0	27.0	0.0	27.0	90	30.0
- SS			0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
- OT			0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
TOTAL			0.0	0.0	3.0	115.7	0.0	118.7	88	135.0

NUMBER OF GAGING STATIONS/SITES: 114

NUMBER OF GAGES FUNDED 100% BY COOP PROGRAM: 12

NOTE: INCLUDES AER FUNDS

0 DUPLICATE GAGE NUMBERS WERE FOUND

TABLE VI - 9

STATION SUMMARY
COOPERATIVE STREAM GAGING PROGRAM
FISCAL YEAR 1988

GALVESTON DISTRICT									
GENERAL INVESTIGATIONS			CONSTRUCTION GENERAL			CORPS			
STUDIES	GEN. COV	PLAN AED	PROJ. CONST	OSH	MRST	CORPS TOTAL	PER- CENT	PROGRAM SUPPORT	
FUNDS (DOLLARS)									
SAGE CLASS - SW	4,190	0	7,080	147,960	0	159,230	86	184,460	0
- GW	0	0	0	0	0	0	0	0	0
- SS	0	0	0	0	0	0	0	0	0
- OT	0	0	0	0	0	0	0	0	0
TOTAL	4,190	0	7,080	147,960	0	159,230	86	184,460	0
PERCENT	2.6	0.0	4.4	92.9	0.0	100.0			
NUMBER OF EQUIVALENT SAGES FUNDED									
SAGE CLASS - SW	0.6	0.0	1.0	26.6	0.0	28.2	86	33.0	0.0
- GW	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0
- SS	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0
- OT	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0
TOTAL	0.6	0.0	1.0	26.6	0.0	28.2	86	33.0	0.0

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NUMBER OF GAGING STATIONS/SITES: 33
NUMBER OF SAGES FUNDED 100% BY COOP PROGRAM: 17
NOTE: INCLUDES AER FUNDS

0 DUPLICATE SAGE NUMBERS WERE FOUND

TABLE VI - 10

STATION SUMMARY
COOPERATIVE STREAM GAGING PROGRAM
FISCAL YEAR 1988

LITTLE ROCK DISTRICT									
GENERAL INVESTIGATIONS			CONSTRUCTION GENERAL			CORPS			
STUDIES	GEN. COV	PLAN AERD	PROJ. CONST	OSH	HRST	TOTAL	PER-CENT	PROGRAM SUPPORT	
FUNDS (DOLLARS)									
GAGE CLASS - SW	10,920	5,480	0	351,390	0	367,790	78	470,760	
- SW	0	0	0	17,500	0	17,500	97	18,100	
- OT	0	1,920	0	6,660	0	8,580	59	14,620	
TOTAL	10,920	7,400	0	0	0	0	0	0	
PERCENT	2.8	1.9	0.0	375,550	0	393,870	78	503,480	
			0.0	95.3	0.0	100.0			
NUMBER OF EQUIVALENT GAGES FUNDED									
GAGE CLASS - SW	3.0	2.6	0.0	51.3	0.0	56.9	79	72.0	
- SW	0.0	0.0	0.0	6.9	0.0	6.9	99	7.0	
- OT	0.0	7.0	0.0	5.2	0.0	12.2	76	16.0	
TOTAL	3.0	9.6	0.0	0.0	0.0	0.0	0	0.0	
			0.0	63.4	0.0	76.0	80	95.0	

NUMBER OF GAGING STATIONS/SITES: 74

NUMBER OF GAGES FUNDED 100% BY COOP PROGRAM: 18
NOTE: INCLUDES AER FUNDS

0 DUPLICATE GAGE NUMBERS WERE FOUND

TABLE VI - 11

STATION SUMMARY
COOPERATIVE STREAM GAGING PROGRAM
FISCAL YEAR 1988

TULSA DISTRICT

FUNDS (DOLLARS)	GENERAL INVESTIGATIONS			CONSTRUCTION GENERAL			CORPS		
	STUDIES	GEN. COV	PLAN A&SD	PROJ. CONST	OSM	MR&T	CORPS TOTAL	PER-CENT	PROGRAM SUPPORT
GAGE CLASS - SW	0	0	0	0	884,300	0	884,300	49	1,288,560
- QW	0	0	0	0	85,890	0	85,890	100	86,275
- SS	0	0	0	0	15,950	0	15,950	100	15,950
- OT	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	986,140	0	986,140	71	1,390,785
PERCENT	0.0	0.0	0.0	0.0	100.0	0.0	100.0		
NUMBER OF EQUIVALENT GAGES FUNDED									
GAGE CLASS - SW	0.0	0.0	0.0	0.0	136.6	0.0	136.6	71	192.0
- QW	0.0	0.0	0.0	0.0	9.0	0.0	9.0	100	9.0
- SS	0.0	0.0	0.0	0.0	40.0	0.0	40.0	100	40.0
- OT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0
TOTAL	0.0	0.0	0.0	0.0	185.6	0.0	185.6	77	241.0

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NUMBER OF GAGING STATIONS/SITES: 196

NUMBER OF GAGES FUNDED 100% BY COOP PROGRAM: 52

NOTE: INCLUDES AER FUNDS

0 DUPLICATE GAGE NUMBERS WERE FOUND

SECTION VII - RESERVOIR DATA SUMMARY

- 1. SWD MAP**
- 2. INDEX BY BASINS**
- 3. INDEX IN ALPHABETICAL ORDER**
- 4. DATA TABLES**

LAKE NAME	STREAM	DIST	STATE	YF	COMP	POOL ELEVATION		CAPACITY**		PAGE NO
						CONS	FC	CONS	FC	
WHITE RIVER BASIN										
REAVES	WHITE	LRD	AR	66		1120.00	1130.00	1652	300	1
TABLE ROCK	WHITE	LRD	AR/MO	58		915.00	931.00	2702	760	1
BULL SHOALS	WHITE	LRD	AR/MO	52		654.00	695.00	3048	2360	2
NORFOLK	NORTH FORK	LRD	AR/MO	45		552.00	580.00	1251	732	2
CLEARWATER	BLACK	LRD	MO	48		494.00	567.00	22	391	3
GREENS FERRY	LITTLE RED	LRD	AR	62		461.00	487.00	1119	934	3
ARKANSAS RIVER BASIN										
FUERLO	ARKANSAS	AD*	CO	74		4880.60	4898.70	264	93	4
TRINIDAD	PURGATORIE R	AD	CO	78		6226.40	6260.00	64	58	4
JOHN MARTIN	ARKANSAS	AD	CO	51		3851.00	3870.00	351	270	5
CHENEY	N F MINNESCAH	TD*	KS	64		1421.60	1429.00	167	81	5
ELDORADO	WALNUT	TD	NS	80		1339.00	1347.50	157	79	6
NAM	ARKANSAS	TD	OK/KS	76		1010.00	1044.50	429	919	6
GREAT SALT PLAINS	SALT FORK ARK	TD	OK	41		1125.00	1138.50	31	240	7
KEYSTONE	ARKANSAS	TD	OK	64		723.00	754.00	618	1219	7
HEYBURN	FOLECAT CR	TD	OK	50		761.50	784.00	7	48	8
TORONTO	VERDIGRIS R	TD	NS	60		901.50	931.00	22	178	8
FALL RIVER	FALL	TD	NS	49		948.50	987.50	24	235	9
ELK CITY	ELK	TD	NS	66		792.00	825.00	34	256	9
BIG HILL	BIG HILL CR	TD	NS	81		858.00	867.50	27	13	10
OOLOGAH	VERDIGRIS R	TD	OK	63		638.00	661.00	553	966	10
HULAH	CANEY	TD	OK/KS	51		733.00	765.00	36	258	11
COFAN	L CANEY	TD	OK/KS	80		710.00	732.00	43	184	11
BIRCH	BIRCH CREEK	TD	OK	79		750.50	774.00	19	39	12
SNATTOOK	HOMINY CREEK	TD	OK	82		714.00	729.00	305	182	12
NEWT GRAHAM LD 18	VERDIGRIS	TD	OK	70		532.00	.00	24	0	13
CHOUTEAU LD 17	VERDIGRIS	TD	OK	70		511.00	.00	23	0	13
COUNCIL GROVE	NEDSHO R	TD	NS	65		1270.00	1289.00	38	76	14
MARION	COTTONWOOD R	TD	KS	68		1350.50	1358.50	86	60	14
JOHN REDMOND	NIOSHO R	TD	NS	64		1039.00	1068.00	82	563	15
FENSACOLA (GRAND LAKE)	NEOSHO (GRAND)	TD*	OK	40		745.00	755.00	1672	525	15
LAKE HUDSON	NEOSHO (GRAND)	TD*	OK	64		619.00	636.00	200	244	16
FORT GIBSON	NEOSHO (GRAND)	TD	OK	52		544.00	582.00	365	919	16
WEBBERS FALLS LD 16	ARKANSAS	TD	OK	70		490.00	.00	165	0	17
TENKILLER FERRY	ILLINOIS R	TD	OK	52		632.00	667.00	654	577	17
CONCHAS	CANADIAN R	AD	NM	39		4201.00	4218.00	330	198	18
SANFORD (MEREDITH)	CANADIAN R	TD*	TX	65		2941.30	2965.00	945	463	18
NORMAN (THUNDERBIRD)	LITTLE R	TD*	TX	65		1039.00	1049.40	120	77	19
OPTIMA	N CANADIAN R	TD	OK	78		2763.50	2779.00	129	101	19
FORT SUPPLY	WOLF CR	TD	OK	42		2004.00	2028.00	14	87	20
CANTON	N CANADIAN R	TD	OK	48		1615.20	1638.00	116	268	20
ARCADIA	ARKANSAS	TD	OK	86		1006.00	1029.50	28	65	21
ELFAULA	CANADIAN R	TD	OK	64		585.00	597.00	2329	1470	21
R S KERR LD 15	ARKANSAS	TD	OK	70		460.00	.00	494	0	22

Lake Summary Table Index

Lake Name	Stream	Dist	State	Yr Comp	Pool Elevation Cons FC	Capacity		Facility
						1000 AF Cons	FC	NO
W O MAYO LD 14	ARKANSAS	TD	OK	70	413.00	16	0	22
WISTER	FOTEAU R	TD	OK	49	471.60	27	400	23
JAMES W TRIMBLE LD 13	ARKANSAS	LRO	AR/OK	69	392.00	54	0	24
OZARK-J T LD 12	ARKANSAS	LRO	AR	69	372.00	148	0	24
PARDANELLE LD 10	ARKANSAS	LRO	AR	64	338.00	486	0	25
BLUE MOUNTAIN	PETIT JEAN	LRO	AR	47	384.00	25	233	25
ARTHUR V ORMOND LD 9	ARKANSAS	LRO	AR	69	287.00	65	0	26
TOAD SUCK FERRY LD 8	ARKANSAS	LRO	AR	69	265.00	35	0	26
NIMROD	FOURCHE LA FAVE	LRO	AR	42	342.00	29	307	27
MURRAY LD 7	ARKANSAS	LRO	AR	69	249.00	87	0	27
DD TERRY LD 6	ARKANSAS	LRO	AR	68	231.00	50	0	28
LD 5	ARKANSAS	LRO	AR	68	213.00	65	0	28
LD 4	ARKANSAS	LRO	AR	68	196.00	70	0	29
LD 3	ARKANSAS	LRO	AR	68	182.00	46	0	29
WILBUR D MILLS LD2	ARKANSAS	LRO	AR	67	162.00	110	0	30
LD 1	ARKANSAS	LRO	AR	67	142.00	2	0	30
RED RIVER BASIN								
ALTUS	N F RED	TD*	OK	46	1559.00	141	21	31
MOUNTAIN PARK (TOM STD.)	W OTTER CREEK	TD*	OK	75	1411.00	96	20	32
LAKE KEMP	WICHITA R	TD*	TX	77	1144.00	299	225	32
MAURIKA	BEAVER CREEK	TD	OK	78	951.40	203	140	34
FOSS	WASHITA	TD*	OK	61	1562.00	256	181	33
FORT COBB	COBB CREEK	TD*	OK	59	1342.00	78	64	34
ARBuckle	ROCK CREEK	TD*	OK	67	872.00	72	36	34
LAKE TEXOMA	RED	TD	TX/OK	45	617.30	2836	2660	35
McGEE CREEK	McGEE CREEK	TD*	OK	87	577.00	113	199	35
FAT MAYSE	SANDERS CREEK	TD	TX	68	451.00	124	65	36
SARDIS	JACK FORK CREEK	TD	OK	84	599.00	302	128	36
HUGO	KIAMICHI R	TD	OK	74	404.50	157	809	37
PINE CREEK	LITTLE R	TD	OK	69	443.50	78	388	37
BROKEN BOW	MOUNTAIN FORK	TD	OK	69	599.50	919	450	38
DEQUEEN	ROLLING FORK	LRO	AR	77	437.00	35	101	39
GILLHAM	COSSATDT	LRO	AR	76	502.00	33	189	39
DIERS	SALINE R	LRO	AR	76	526.00	30	67	40
MILLWOOD	LITTLE R	LRO	AR	66	259.20	207	1653	40
WRIGHT PATMAN	SULPHUR RIVR	FWD	TX	56	220.00	143	2509	41
LAKE O THE PINES	CYPRESS CREEK	FWD	TX	60	228.50	251	580	41
NECHES RIVER BASIN								
SAM RAYBURN	ANGELINA R	FWD	TX	65	164.40	2898	1009	42
R A STEINHAGEN	NECHES R	FWD	TX	51	81.00	70	24	42
TRINITY RIVER BASIN								
RENBROOK	CLEAR FORK	FWD	TX	52	694.00	88	170	43
JOE FOOL	MOUNTAIN CREEK	FWD	TX	86	522.00	143	123	43
RAY ROBERTS	ELM FORK	FWD	TX	87	632.50	749	260	44
LEWISVILLE	ELM FORK	FWD	TX	54	515.00	465	525	44
GRAPEVINE	DENTON CR	FWD	TX	52	535.00	189	248	45

LAKE SUMMARY TABLE INDEX

LAKE NAME	STREAM	DIST	STATE	YR COMP	POOL ELEVATION		CAPACITY**		PAGE
					CONS	FC	CONS	FC	
LAVON	EAST FORK	FWD	TX	77	492.00	503.50	457	277	45
NAVARRO MILLS	RICHLAND CR	FWD	TX	68	424.50	443.00	63	149	46
BARDWELL	WAXAHACHIE CR	FWD	TX	65	421.00	439.00	55	85	46
SAN JACINTO RIVER BASIN									
BARNER	RUFFALO BAYOU	GD	TX	45	.00	107.00	0	207	47
ADDICKS	RUFFALO BAYOU	GD	TX	48	.00	114.00	0	205	47
BRAZOS RIVER BASIN									
WHITNEY	BRAZOS	FWD	TX	51	533.00	571.00	627	1372	48
ARUILLA	ARUILLA	FWD	TX	83	537.50	556.00	34	87	48
WACO	ROSQUE	FWD	TX	65	454.00	500.00	153	574	48
PROCTOR	LEON R	FWD	TX	63	1162.00	1197.00	59	315	49
RELTON	LEON R	FWD	TX	54	594.00	631.00	458	640	50
STILLHOUSE H	LAMPASAS R	FWD	TX	68	622.00	666.00	236	395	50
GEORGETOWN	N F SAN GABRIEL	FWD	TX	79	791.00	834.00	37	93	51
GRANGER	SAN GABRIEL	FWD	TX	79	504.00	524.00	66	179	51
SUMERVILLE	YEGUA CR	FW	TX	67	238.00	258.00	160	347	51
COLORADO RIVER BASIN									
TWIN BUTTES	S&M CONCHO R	FWD*	TX	63	1940.20	1969.10	184	454	53
O C FISHER	N CONCHO R	FWD	TX	52	1908.00	1938.50	119	277	53
HORDS CR	HORDS CR	FWD	TX	48	1900.00	1920.00	9	17	54
MARSHALL FORD	COLORADO R	FWD*	TX	40	681.00	714.00	1172	780	54
GUADALUPE RIVER BASIN									
CANYON	GUADALUPE R	FWD	TX	64	909.00	943.00	386	355	55
COLORADO RIVER BASIN									
NAVAJO	SAN JUAN	AD*	NM	62	5090.00	6085.00	-	-	56
RIO GRANDE BASIN									
FLATORO	CONJOS R	AD*	CO	51	10037.50	10034.00	54	6	57
ARIQUIU	RIO CHAMA	AD	NM	63	.00	6283.50	0	568	57
COCHITI	RIO GRANDE	AD	NM	75	5321.45	5460.50	47	539	58
G. LISTED	GALISTEO CR	AD	NM	70	.00	5608.00	0	90	58
JIMESZ CANYON	JEMEZ R	AD	NM	53	5160.00	5232.00	2	104	59
SANTA ROSA	PECOS R	AD	NM	80	4726.50	4797.00	267	182	59
SUMNER	PILOS R	AD*	NM	37	4261.00	4282.00	47	86	60
TWO RIVERS	RIO HONDO	AD	NM	63	.00	4032.00	0	168	60

*Section 7 Flood Control Projects

**Includes dead storage, conservation, water supply, power, irrigation, etc.

ALPHABÉTICAL INDEX

PROJECT NAME	RIVER BASIN	PAGE NO.
ABIQUIU	RIO GRANDE	57
ADDICKS	SAN JACINTO RIVER	47
ALTUS	RED RIVER	31
AQUILLA	BRAZOS RIVER	48
ARBUCKLE	RED RIVER	34
ARCADIA	ARKANSAS RIVER	21
ARTHUR V. ORMOND (LD 13)	ARKANSAS RIVER	26
B A STEINHAGEN	NECHES RIVER	42
BARDWELL	TRINITY RIVER	46
BARKER	SAN JACINTO RIVER	47
BEAVER	WHITE RIVER	1
BELTON	BRAZOS RIVER	50
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BIG HILL	ARKANSAS RIVER	10
BIRCH	ARKANSAS RIVER	12
BLUE MOUNTAIN	ARKANSAS RIVER	25
BROKEN BOW	RED RIVER	38
BULL SHOALS	WHITE RIVER	2
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DD TERRY (LD 6)	ARKANSAS RIVER	28
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EUFAULA	ARKANSAS RIVER	21
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SUMMARY OF LAKE CONDITIONS FOR WATER YEAR 1988
LITTLE ROCK DISTRICT
WHITE RIVER BASIN

BEAVER	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1,000 AC. FT.)													
Avg 1968 thru 1988	53.0	112.9	126.6	74.5	102.8	196.6	173.6	118.4	78.7	21.3	15.5	28.6	1102.5
WY 1988	12.6	71.8	382.5	82.0	65.8	305.5	261.1	22.3	11.1	22.2	5.5	12.1	1254.5
Releases (1,000 AC. FT.)													
Avg 1968 thru 1988	34.6	52.6	92.7	86.5	90.8	101.7	119.0	99.7	81.4	84.8	80.4	53.4	977.6
WY 1988	9.6	6.3	215.7	168.9	124.8	228.7	171.2	119.2	34.2	16.2	37.3	19.2	1151.3
Basin Rainfall (inches)													
Avg 1968 thru 1988	4.6	4.4	3.5	1.9	2.4	4.5	4.2	4.8	4.0	2.7	3.2	4.0	44.2
WY 1988	3.2	5.6	9.1	1.4	2.2	7.9	4.4	1.7	1.4	5.3	2.3	5.3	49.8
Deviation	-1.4	1.2	5.6	-5	-2	3.4	.2	-3.1	-2.6	2.6	-.9	1.3	5.6
Pool Elevation													
End of Month	1116.59	1118.79	1124.44	1121.30	1119.03	1121.48	1124.23	1120.46	1119.14	1118.92	1117.35	1116.82	
Maximum	1116.74	1118.79	1125.38	1124.44	1121.32	1121.48	1125.14	1124.23	1120.49	1119.17	1118.92	1117.42	
Minimum	1116.28	1116.41	1118.79	1121.30	1119.03	1118.42	1121.48	1120.46	1119.11	1118.88	1117.33	1116.76	
Pool Content EQM (1,000 AC. FT.)	1557.7	1618.1	1780.8	1689.1	1624.8	1694.2	1774.5	1665.1	1627.9	1621.8	1578.4	1564.0	
TABLE ROCK LAKE													
Inflows (1,000 AC. FT.)													
Avg 1961 thru 1988	110.9	226.0	263.3	212.5	234.8	404.6	421.8	352.2	221.2	141.2	135.6	98.5	2822.6
WY 1988	30.1	130.2	959.2	329.0	312.7	771.5	634.6	198.1	63.3	85.5	61.8	52.9	3628.9
Releases (1,000 AC. FT.)													
Avg 1961 thru 1988	108.6	183.6	280.0	250.2	214.8	308.9	350.2	319.1	205.4	206.4	166.8	121.6	2715.6
WY 1988	40.3	147.9	335.6	571.3	332.9	560.6	770.9	240.5	116.7	90.2	192.9	110.0	3509.8
Intervening Basin Rainfall (inches)													
Avg 1961 thru 1988	4.6	4.2	3.6	1.8	2.0	4.2	4.2	4.4	4.4	2.9	3.6	3.9	43.8
WY 1988	3.4	5.0	8.8	.9	2.2	6.2	3.8	2.1	1.6	4.7	3.8	5.2	47.7
Deviation	-1.2	.8	5.2	-.9	.2	2.0	-.4	-2.3	-2.8	1.8	.2	1.3	3.9
Pool Elevation													
End of Month	905.78	905.08	919.84	914.13	913.43	918.00	914.50	913.02	911.20	910.61	906.86	905.06	
Maximum	906.35	905.79	919.84	920.00	914.16	918.00	921.58	914.60	913.02	911.81	910.61	906.86	
Minimum	905.58	904.08	903.46	913.20	911.63	913.16	914.50	912.91	911.13	910.61	906.80	905.00	
Pool Content EQM (1,000 AC. FT.)	2326.6	2300.0	2915.8	2664.6	2635.1	2833.0	2680.5	2617.8	2542.2	2518.0	2368.5	2299.3	

WHITE RIVER BASIN

BULL SHOALS LAKE											
Inflows (1,000 AC. FT.)											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	TOTAL
Avg 1953 thru 1968	143.9	274.2	390.5	306.2	332.3	526.2	562.0	554.1	336.5	364.0	4147.0
WY 1968	65.0	258.6	980.6	694.8	461.5	945.7	1098.9	297.6	155.6	168.9	5506.1
Releases (1,000 AC. FT.)											
Avg 1953 thru 1968	204.1	196.4	286.9	356.6	323.5	370.5	408.9	395.7	309.9	390.6	3828.5
WY 1968	45.1	359.7	383.4	849.0	554.6	699.7	963.8	455.2	294.2	177.2	5211.8
Basin Rainfall (inches)											
Avg 1953 thru 1968	3.9	4.3	3.3	1.7	2.1	3.7	4.1	4.2	3.4	3.2	41.2
WY 1968	3.5	4.5	9.0	.9	2.1	6.0	3.3	2.1	2.4	5.3	47.1
Deviation	-.4	.2	5.7	-.8	.0	2.3	-.8	-2.1	-1.0	2.1	5.9
Pool Elevation											
End of Month	647.30	644.52	657.80	654.16	651.77	656.78	659.16	655.24	651.53	650.76	648.61
Maximum	647.31	647.51	657.80	660.34	654.16	656.78	663.46	659.40	655.33	651.97	649.26
Minimum	646.88	644.52	644.25	654.16	651.41	651.77	656.78	655.24	651.27	650.51	648.23
Pool Content EDM (1,000 AC. FT.)	2754.6	2639.3	3223.6	3055.3	2947.9	3175.7	3288.7	3104.4	2937.3	2903.4	2810.2

HORNOK LAKE											
Inflows (1,000 AC. FT.)											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	TOTAL
Avg 1946 thru 1968	52.1	98.3	126.6	119.3	131.7	186.0	197.7	186.4	105.3	885.2	2183.3
WY 1968	33.8	57.1	364.3	127.3	108.1	292.4	258.4	92.1	70.9	95.1	1598.0
Releases (1,000 AC. FT.)											
Avg 1946 thru 1968	66.4	62.9	101.1	135.3	121.1	75.7	139.0	67.7	108.8	119.1	1190.7
WY 1968	39.4	15.8	154.6	329.4	118.3	243.9	274.2	44.5	38.5	83.6	1508.0
Basin Rainfall (inches)											
Avg 1946 thru 1968	3.1	3.8	3.2	2.4	2.7	3.7	4.1	4.8	4.0	3.5	41.8
WY 1968	3.2	4.1	8.6	1.4	2.0	5.9	3.1	2.7	1.6	5.0	45.3
Deviation	.1	.3	5.4	-1.0	-.7	2.2	-1.0	-2.1	-2.4	1.5	3.5
Pool Elevation											
End of Month	550.54	552.17	560.98	552.04	551.32	553.18	552.05	553.68	554.55	554.55	550.68
Maximum	551.16	552.26	560.98	561.46	552.10	553.18	557.33	553.68	554.55	555.14	552.36
Minimum	550.22	550.54	551.58	552.04	551.26	549.67	552.05	551.67	553.68	554.50	550.65
Pool Content EDM (1,000 AC. FT.)	1219.4	1254.9	1459.6	1252.1	1236.2	1277.3	1252.3	1288.5	1308.1	1308.1	1222.4

WHITE RIVER BASIN

CLEARWATER LAKE											
Inflows (1,000 AC. FT.)											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	TOTAL
Avg 1949 thru 1968	22.8	50.6	64.9	55.8	57.2	90.5	93.5	75.2	38.5	26.4	615.2
WY 1968	14.8	24.5	177.8	78.1	54.8	103.0	62.9	19.2	10.6	18.2	592.7
Releases (1,000 AC. FT.)											
Avg 1949 thru 1968	23.4	33.0	60.1	61.6	59.1	78.9	88.4	74.9	50.3	33.3	617.4
WY 1968	18.2	22.8	102.2	154.8	55.1	65.9	99.1	11.9	10.0	19.6	590.7
Basin Rainfall (inches)											
Avg 1949 thru 1968	3.0	4.1	3.5	2.5	2.7	4.1	4.3	4.5	3.7	3.7	42.9
WY 1968	3.1	3.7	7.9	2.4	2.0	5.8	1.7	2.3	1.5	4.3	42.1
Deviation	.1	-.4	4.4	-.1	-.7	1.7	-2.6	-2.2	-2.2	.6	-.8
Pool Elevation											
End of Month	494.32	495.26	521.93	494.41	494.09	510.55	494.15	497.99	497.90	496.79	494.89
Maximum	497.29	495.47	522.26	521.93	495.77	510.55	511.91	498.19	497.99	498.29	497.29
Minimum	494.05	494.06	494.02	494.41	493.76	494.03	493.76	494.15	497.59	496.79	494.89
Pool Content EOM											
(1,000 AC. FT.)	22.4	24.0	99.5	22.6	22.1	58.9	22.2	28.9	28.7	26.6	23.4

GREYS FERRY LAKE											
Inflows (1,000 AC. FT.)											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	TOTAL
Avg 1965 thru 1968	45.9	109.9	192.5	108.4	138.0	140.5	224.2	160.0	53.4	10.8	1217.4
WY 1968	.2	71.0	363.0	176.3	132.3	23.9	230.3	20.8	4.8	15.5	1048.4
Releases (1,000 AC. FT.)											
Avg 1965 thru 1968	36.7	40.9	78.5	144.8	136.5	137.6	136.0	126.4	90.0	103.9	1186.5
WY 1968	9.3	4.7	33.7	244.0	292.5	259.8	186.4	26.5	43.9	90.2	1253.1
Basin Rainfall (inches)											
Avg 1964 thru 1968	4.1	4.7	4.6	2.6	3.1	4.9	4.8	5.1	3.6	3.3	48.9
WY 1968	2.8	6.9	8.5	2.9	2.7	5.7	4.4	2.5	1.1	4.9	48.5
Deviation	-1.3	2.2	3.9	.3	-.4	.8	-.4	-2.6	-2.5	1.6	-.4
Pool Elevation											
Maximum	455.64	457.68	467.81	465.66	460.49	459.54	460.63	460.03	458.29	455.39	452.92
Minimum	456.28	457.68	467.81	468.00	466.06	462.03	462.21	460.63	460.05	458.29	453.31
	455.60	455.51	457.68	465.63	460.49	459.28	459.54	460.03	458.29	455.39	452.71
Pool Content EOM											
(1,000 AC. FT.)	1746.2	1807.4	2132.5	2060.0	1894.4	1864.7	1898.8	1879.9	1826.0	1738.7	1665.7

PUEBLO RESERVOIR

ARKANSAS RIVER BASIN

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft.)													
Avg 1894 thru 1988	22.13	22.49	21.35	19.92	16.75	16.16	24.11	68.51	128.29	87.26	55.89	25.97	508.84
FY 1988	36.07	28.36	30.85	30.23	23.61	27.39	27.95	48.95	100.93	48.51	39.59	21.77	464.21
Releases (1000 Ac-Ft.)													
Avg 1966 thru 1988	20.41	16.35	14.23	14.56	13.47	14.90	27.17	66.12	124.91	89.14	56.42	25.01	482.70
FY 1988	25.64	16.56	14.59	29.55	16.94	21.98	33.33	59.11	101.85	94.62	77.13	24.39	515.69
Rainfall (Inches)													
Avg 1938 thru 1988	.63	.36	.48	.33	.26	1.04	.93	1.84	1.60	1.75	2.02	.70	11.94
FY 1988	.04	.39	.74	.61	1.28	.41	.45	1.09	3.46	.92	2.22	.77	9.38
Pool Elevation (EDM)													
Maximum	4872.43	4875.03	4878.55	4878.62	4879.96	4880.83	4879.24	4876.44	4875.66	4863.74	4852.46	4851.24	
Minimum	4872.64	4875.03	4878.64	4878.80	4879.96	4881.07	4880.79	4879.04	4876.37	4875.54	4863.30	4852.34	
	4872.43	4872.30	4875.21	4878.43	4878.50	4880.11	4879.24	4876.44	4875.66	4863.74	4852.46	4851.24	
Pool Content (EDM)													
(1000 Ac-Ft.)	228.85	239.99	255.65	255.97	262.11	266.14	258.80	246.19	242.75	194.23	154.70	150.78	

TRINIDAD LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft.)													
Avg 1896 thru 1988	2.37	1.70	1.51	1.30	1.23	1.61	4.29	10.96	13.21	10.16	8.47	3.71	57.27
FY 1988	1.49	1.28	1.27	1.08	1.22	1.27	1.56	2.60	5.48	5.92	4.11	3.04	30.32
Releases (1000 Ac-Ft.)													
Avg 1978 thru 1988	1.73	.48	.25	.18	.22	.21	1.96	9.60	13.97	12.63	10.54	9.33	61.10
FY 1988	.06	.39	.04	0	.14	.19	0	11.30	12.48	10.28	13.87	6.95	55.71
Rainfall (Inches)													
Avg 1978 thru 1988	.98	.99	.68	.52	.64	1.21	1.39	3.03	2.33	2.24	3.35	1.42	18.78
FY 1988	.37	.98	1.14	.57	.26	.96	1.19	3.20	2.46	1.53	1.65	2.24	16.55
Pool Elevation (EDM)													
Maximum	6209.72	6210.31	6211.29	6212.24	6213.18	6213.92	6214.87	6206.51	6198.74	6193.28	6180.18	6173.58	
Minimum	6209.72	6210.31	6211.29	6212.24	6213.18	6213.92	6214.87	6214.93	6206.19	6198.67	6193.04	6179.63	
	6208.76	6209.52	6210.35	6211.30	6212.25	6213.21	6213.97	6206.51	6198.64	6193.28	6180.18	6172.20	
Pool Content (EDM)													
(1000 Ac-Ft.)	46.51	48.37	49.46	50.54	51.61	52.47	53.59	44.34	36.87	32.03	21.87	17.66	

ARKANSAS RIVER BASIN

JOHN MARTIN RESERVOIR

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft)													
Avg 1914 thru 1988	8.82	6.83	7.48	8.99	8.00	6.69	14.07	32.61	52.04	33.21	32.72	9.77	223.26
FY 1988	6.84	13.76	17.72	17.40	20.05	14.50	15.40	18.48	10.01	11.77	7.36	7.27	160.57
Release (1000 Ac-Ft)													
Avg 1956 thru 1988	11.10	1.52	.87	.37	.92	2.02	25.04	28.05	33.96	38.52	34.92	19.11	196.40
FY 1988	19.06	4.68	.28	.22	.23	6.32	31.33	38.63	46.42	66.58	56.43	19.14	289.26
Rainfall (Inches)													
Avg 1943 thru 1988	.76	.41	.24	.22	.25	.58	1.00	2.10	1.52	1.95	1.79	.90	11.77
FY 1988	.01	.35	.50	.21	.13	.06	.72	1.46	3.89	1.85	.86	4.98	15.02
Pool Elevation (EOM)													
Maximum	3841.47	3842.25	3843.95	3845.67	3847.52	3847.87	3845.83	3843.12	3838.30	3830.35	3821.44	3818.48	
Minimum	3843.04	3842.25	3843.25	3845.67	3847.52	3848.12	3848.50	3845.81	3843.03	3837.98	3830.04	3821.33	
	3841.47	3841.40	3842.33	3843.99	3845.75	3847.57	3845.83	3843.12	3838.30	3830.35	3821.44	3818.48	
Pool Content (EOM)													
(1000 Ac-Ft)	246.37	253.68	269.98	287.16	300.18	303.93	282.46	255.64	211.64	150.04	96.04	81.70	

VII-5

ARKANSAS RIVER BASIN

CHENEY RESERVOIR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1938 THRU 1981	11.66	7.53	6.44	6.63	8.27	13.31	14.69	18.68	17.71	9.29	5.22	9.33	128.8
FY 1988	3.93	7.10	10.39	7.19	4.90	12.18	19.35	9.90	6.17	12.40	4.32	1.55	99.4
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1988	9.55	12.79	3.72	4.20	4.76	10.93	16.75	14.42	11.71	8.86	1.80	1.98	101.5
FY 1988	0.00	1.31	9.63	10.92	8.38	10.24	15.15	2.40	2.56	0.00	0.00	0.00	60.6
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.18	1.30	0.91	0.69	0.93	1.65	2.43	4.03	4.02	3.09	2.95	3.00	27.18
FY 1988	1.37	0.96	0.87	0.29	0.25	0.91	3.29	0.62	2.00	3.95	4.24	1.16	19.91
DEVIATION	-0.81	-0.34	-0.04	-0.40	-0.68	-0.74	0.86	-3.41	-2.02	0.86	1.29	-1.84	-7.27
POOL ELEVATION													
END OF MONTH	1421.61	1421.88	1421.77	1421.89	1421.68	1421.52	1421.59	1421.69	1420.98	1421.40	1420.80	1420.00	
MAXIMUM	1421.74	1421.88	1421.88	1421.96	1421.89	1422.05	1422.44	1421.70	1421.90	1421.59	1421.40	1420.80	
MINIMUM	1421.50	1421.61	1421.58	1421.67	1421.58	1421.46	1421.52	1421.49	1420.93	1420.71	1420.80	1420.00	
POOL CONTENT-EOM													
(1000AC.FT)	167.17	169.73	168.69	169.83	167.83	166.31	166.98	167.93	161.19	165.17	159.54	152.22	

ARKANSAS RIVER BASIN

ELDORADO	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AUG 1921 THRU 1978	5.00	4.40	2.80	2.70	2.80	6.20	10.20	11.80	14.40	7.40	3.40	5.50	76.6
FY 1988	0.39	0.90	9.28	4.23	0.26	13.97	33.38	5.26	0.87	5.48	0.02	0.16	74.2
RELEASES(1000AC.FT.)													
AUG 1983 THRU 1988	16.00	3.39	6.66	2.52	2.17	6.17	12.08	8.56	6.72	2.70	1.21	0.71	68.9
FY 1988	0.39	0.36	13.15	7.83	0.34	7.50	17.52	4.40	1.12	0.84	0.80	0.52	54.8
RAINFALL(INCHES)													
AUG 1930 THRU 1980	2.49	1.67	1.14	0.89	0.97	1.96	2.91	4.34	4.84	3.65	3.18	3.80	31.84
FY 1988	2.39	1.40	0.71	0.09	0.08	1.16	4.27	1.12	1.19	3.67	3.50	0.40	19.98
DEVIATION	-0.10	-0.27	-0.43	-0.80	-0.89	-0.80	1.36	-3.22	-3.65	0.02	0.32	-3.40	-11.84
POOL ELEVATION													
END OF MONTH	1338.32	1338.15	1337.60	1337.09	1337.09	1337.64	1339.36	1339.11	1338.58	1338.64	1337.83	1337.23	
MAXIMUM	1338.75	1338.33	1338.51	1337.60	1337.12	1337.92	1340.22	1339.40	1339.11	1338.87	1338.64	1337.83	
MINIMUM	1338.30	1338.11	1337.60	1336.95	1337.03	1337.09	1337.64	1338.92	1338.56	1338.52	1337.83	1337.23	
POOL CONTENT-EOM													
(1000AC.FT)	151.65	150.31	146.10	142.23	142.23	146.40	159.92	157.89	153.69	154.16	147.84	143.29	

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ARKANSAS RIVER BASIN

KAW LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AUG 1922 THRU 1981	158.53	125.65	84.51	85.12	96.99	171.76	249.25	301.29	342.30	239.71	131.96	141.41	2128.5
FY 1988	63.77	91.04	244.07	211.83	103.34	264.30	584.33	178.51	69.12	78.64	33.62	30.35	1052.9
RELEASES(1000AC.FT.)													
AUG 1977 THRU 1988	201.06	154.45	103.09	119.72	105.27	283.26	355.75	246.28	325.13	239.24	81.84	94.41	2309.5
FY 1988	67.30	67.22	127.46	363.98	125.50	229.28	508.12	229.75	57.72	69.98	23.55	20.50	1890.4
RAINFALL(INCHES)													
AUG 1930 THRU 1980	2.39	1.66	1.13	0.87	1.03	1.88	2.86	4.29	4.44	3.50	3.17	3.58	30.80
FY 1988	1.22	1.64	0.92	0.28	0.16	1.38	3.79	1.13	1.23	2.59	3.61	0.93	18.88
DEVIATION	-1.17	-0.02	-0.21	-0.59	-0.87	-0.50	0.93	-3.16	-3.21	-0.91	0.44	-2.65	-11.92
POOL ELEVATION													
END OF MONTH	1010.06	1011.20	1017.20	1009.08	1007.58	1009.45	1013.33	1010.03	1010.08	1010.01	1009.93	1010.06	
MAXIMUM	1010.51	1011.23	1017.20	1017.75	1009.08	1013.46	1023.54	1013.45	1010.11	1011.04	1011.05	1011.79	
MINIMUM	1009.88	1009.78	1010.80	1009.06	1007.36	1007.52	1009.45	1009.20	1009.93	1009.96	1009.90	1009.83	
POOL CONTENT-EOM													
(1000AC.FT)	429.64	449.46	564.26	413.14	388.66	419.36	488.17	429.12	429.98	428.77	427.42	429.64	

ARKANSAS RIVER BASIN

GREAT SALT PLAINS LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AUG 1923 THRU 1981	21.23	15.25	9.13	9.23	13.13	21.07	31.69	54.65	45.26	22.56	21.24	19.10	283.5
FY 1988	24.69	15.61	29.16	36.69	20.39	84.10	133.49	33.12	21.20	16.36	1.75	3.75	420.3
RELEASES(1000AC.FT.)													
AUG 1976 THRU 1988	27.72	22.43	11.21	11.15	14.77	38.51	41.01	56.51	55.55	23.40	5.61	11.23	319.1
FY 1988	43.26	12.82	27.42	35.41	21.18	80.33	121.33	36.88	19.88	9.90	2.16	1.38	412.0
RAINFALL(INCHES)													
AUG 1930 THRU 1980	1.87	1.19	0.84	0.69	0.91	1.52	2.35	3.71	3.57	2.54	2.89	2.39	24.47
FY 1988	1.37	0.25	0.27	0.37	0.00	1.58	2.68	0.81	1.27	1.83	1.94	1.01	13.38
DEVIATION	-0.50	-0.94	-0.57	-0.32	-0.91	0.06	0.33	-2.90	-7.30	-0.71	-0.95	-1.38	-11.09
POOL ELEVATION													
END OF MONTH	1125.37	1125.51	1125.61	1125.67	1125.47	1125.58	1126.47	1125.62	1125.16	1125.27	1124.53	1124.40	
MAXIMUM	1127.52	1125.57	1125.92	1126.18	1125.68	1127.26	1128.49	1126.47	1126.05	1125.52	1125.37	1124.62	
MINIMUM	1125.31	1125.18	1125.27	1125.38	1125.35	1125.30	1125.56	1125.26	1125.08	1124.90	1124.53	1124.21	
POOL CONTENT-EOM (1000AC.FT)	34.85	36.15	37.08	37.64	35.78	36.80	45.63	37.17	32.90	33.92	27.59	26.53	

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ARKANSAS RIVER BASIN

KEYSTONE LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AUG 1923 THRU 1981	394.68	288.16	175.45	167.90	194.73	336.81	536.34	752.88	738.79	466.47	283.50	328.51	4664.2
FY 1988	377.26	192.40	522.64	717.02	284.83	1119.67	1711.14	463.34	181.49	165.22	56.13	272.43	6063.6
RELEASES(1000AC.FT.)													
AUG 1976 THRU 1988	548.13	307.50	220.96	228.06	226.89	586.61	682.35	675.59	713.86	463.65	183.24	198.90	5035.7
FY 1988	400.96	114.11	317.43	831.89	421.95	1050.37	1670.37	492.56	196.48	179.74	90.79	202.65	5969.3
RAINFALL(INCHES)													
AUG 1930 THRU 1980	2.38	1.72	1.18	0.97	1.15	1.87	2.87	4.41	4.16	3.14	2.99	3.40	30.24
FY 1988	0.66	1.59	1.11	0.56	0.13	3.07	4.74	1.05	1.46	2.69	1.83	4.95	23.84
DEVIATION	-1.72	-0.13	-0.07	-0.41	-1.02	1.20	1.87	-3.36	-2.70	-0.45	-1.16	1.55	-6.40
POOL ELEVATION													
END OF MONTH	721.35	724.48	731.63	727.66	721.67	724.32	725.47	723.96	722.70	721.43	719.25	722.07	
MAXIMUM	724.92	724.48	731.63	731.84	727.66	731.96	739.18	725.47	724.26	732.12	721.51	723.93	
MINIMUM	721.03	721.35	723.24	727.66	721.67	721.53	724.32	721.30	722.68	721.43	719.25	717.91	
POOL CONTENT-EOM (1000AC.FT)	519.88	593.68	796.17	677.93	527.05	589.68	618.89	580.72	550.65	521.67	475.08	536.06	

ARKANSAS RIVER BASIN

HEYBURN LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLWS(1000AC.FT.)													
AUG 1929 THRU 1981	2.44	2.65	1.50	1.30	1.92	3.24	6.15	7.82	7.59	2.51	1.53	3.77	42.4
FY 1988	0.08	1.94	10.02	1.89	1.46	24.65	16.05	0.86	0.07	1.02	0.15	1.26	59.4
RELEASES(1000AC.FT.)													
AUG 1976 THRU 1988	3.81	2.60	2.97	2.30	4.70	7.76	5.57	10.02	5.57	0.68	0.05	0.56	46.6
FY 1988	0.00	0.79	9.63	2.16	1.31	22.32	17.76	0.61	0.03	0.04	0.00	0.42	55.1
RAINFALL(INCHES)													
AUG 1930 THRU 1980	2.84	2.27	1.49	1.43	1.54	2.33	3.51	4.95	4.32	3.12	2.98	3.99	34.77
FY 1988	1.11	4.57	3.67	1.11	0.86	6.29	3.63	1.25	0.73	5.91	1.79	4.47	35.39
DEVIATION	-1.73	2.30	2.18	-0.32	-0.68	3.96	0.12	-3.70	-3.59	2.79	-1.19	0.48	0.62
POOL ELEVATION													
END OF MONTH	760.79	761.88	762.24	761.80	761.79	763.85	761.83	761.60	761.01	761.46	761.16	761.85	
MAXIMUM	761.15	762.45	763.48	762.48	762.22	767.26	769.26	761.83	761.60	761.77	761.46	762.03	
MINIMUM	760.73	760.71	761.64	761.59	761.70	761.77	761.83	761.60	761.01	760.00	760.96	760.91	
POOL CONTENT-EOM (1000AC.FT)	6.51	7.45	7.78	7.38	7.37	9.43	7.40	7.20	6.68	7.08	6.81	7.42	

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ARKANSAS RIVER BASIN

TORONTO LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLWS(1000AC.FT.)													
AUG 1922 THRU 1981	19.64	18.97	11.46	12.33	13.35	32.04	46.42	40.55	52.97	34.79	9.13	23.24	314.9
FY 1988	1.08	19.28	71.96	24.95	8.92	70.75	163.44	7.89	0.90	17.02	0.92	0.33	387.5
RELEASES(1000AC.FT.)													
AUG 1976 THRU 1988	31.12	23.45	18.22	10.10	22.12	46.01	58.11	33.98	55.47	16.96	10.10	8.77	334.9
FY 1988	1.14	13.33	69.66	32.70	9.33	68.62	164.11	7.07	0.20	13.40	1.00	0.30	380.9
RAINFALL(INCHES)													
AUG 1930 THRU 1980	2.71	2.05	1.31	1.05	1.05	2.42	3.23	4.63	5.05	3.88	3.36	4.28	35.02
FY 1988	2.99	2.54	1.30	0.30	0.22	2.06	4.45	1.23	0.58	3.57	4.47	1.48	25.19
DEVIATION	0.28	0.49	-0.01	-0.75	-0.83	-0.36	1.22	-3.40	-4.47	-0.31	1.11	-2.80	-9.83
POOL ELEVATION													
END OF MONTH	901.62	903.73	904.41	901.89	901.67	902.30	901.68	901.50	901.17	902.00	901.32	900.90	
MAXIMUM	901.89	904.59	912.89	904.41	901.95	909.95	924.18	901.88	901.56	904.89	902.00	901.32	
MINIMUM	901.42	901.54	901.59	901.62	901.52	901.37	901.62	901.45	901.13	901.17	901.32	900.89	
POOL CONTENT-EOM (1000AC.FT)	21.35	27.29	29.35	22.07	21.48	23.20	21.51	21.03	20.15	22.36	20.55	19.45	

ARKANSAS RIVER BASIN

FALL RIVER LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1922 THRU 1981	15.23	14.09	8.25	9.31	10.09	23.68	36.26	33.38	37.93	18.32	6.26	15.10	227.9
FY 1988	1.43	12.09	49.45	25.21	8.46	51.47	128.28	11.11	1.72	2.75	1.04	0.17	293.2
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1988	20.74	16.51	12.42	9.26	16.18	34.51	45.54	31.77	41.81	20.01	5.15	3.17	257.1
FY 1988	0.39	9.37	42.67	34.62	8.08	48.04	129.00	12.95	0.80	0.26	0.31	0.27	286.8
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.61	1.76	1.23	0.95	1.04	2.17	3.11	4.45	4.86	3.69	3.10	4.03	33.00
FY 1988	2.68	2.88	1.51	0.22	0.27	2.46	5.63	1.57	0.97	4.65	4.73	0.88	28.45
DEVIATION	0.07	1.12	0.28	-0.73	-0.77	0.29	2.52	-2.88	-3.89	0.96	1.63	-3.15	-4.55
POOL ELEVATION													
END OF MONTH	948.86	949.76	952.06	948.70	948.77	949.54	949.61	948.81	948.44	949.00	948.51	947.98	
MAXIMUM	948.86	949.90	956.85	952.06	949.08	953.63	948.37	949.68	948.81	949.08	949.11	948.51	
MINIMUM	948.62	948.49	948.62	948.53	948.47	948.57	949.17	948.57	948.40	948.44	948.51	947.96	
POOL CONTENT-EOM (1000AC.FT)	22.77	25.04	31.58	22.39	22.56	24.48	24.66	22.65	21.78	23.10	21.95	20.70	

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ARKANSAS RIVER BASIN

ELK CITY LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1922 THRU 1981	18.46	17.90	8.53	10.18	9.80	25.74	41.73	40.68	42.54	21.54	5.05	14.88	257.0
FY 1988	0.88	13.69	59.42	26.33	6.88	67.48	157.09	7.88	1.53	5.00	2.72	10.88	359.8
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1988	40.25	20.20	15.99	16.02	16.93	42.51	42.42	34.68	47.52	46.98	9.53	5.97	339.0
FY 1988	0.74	2.27	53.41	42.63	7.64	56.16	162.72	7.09	0.59	0.74	0.74	2.97	337.7
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.81	2.22	1.35	1.23	1.17	2.33	3.45	4.71	5.10	3.63	3.15	4.33	35.48
FY 1988	1.46	3.47	1.68	0.37	0.18	3.10	7.37	1.89	0.86	4.98	2.67	4.63	32.66
DEVIATION	-1.35	1.25	0.33	-0.86	-0.99	0.77	3.92	-2.82	-4.24	1.35	-0.48	0.30	-2.82
POOL ELEVATION													
END OF MONTH	793.87	796.56	797.83	794.24	793.97	796.40	794.26	793.95	793.65	794.30	794.31	795.96	
MAXIMUM	794.05	796.64	803.05	797.83	794.24	799.45	815.47	794.55	794.01	794.33	794.53	796.52	
MINIMUM	793.77	793.77	796.06	794.00	793.95	793.94	794.03	793.95	793.65	793.57	793.93	793.97	
POOL CONTENT-EOM (1000AC.FT)	35.90	47.31	53.31	37.37	36.29	46.58	39.39	38.23	37.12	39.54	39.58	45.98	

ARKANSAS RIVER BASIN

BIG HILL	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1929 THRU 1978	1.69	1.19	0.75	1.05	0.67	1.69	2.30	3.13	3.60	1.73	0.27	1.33	19.4
FY 1988	0.03	1.06	2.28	0.19	0.17	6.70	5.73	0.08	0.26	0.26	0.06	0.77	17.6
RELEASES(1000AC.FT.)													
AVG 1984 THRU 1988	4.43	1.52	1.22	0.62	2.70	3.39	3.41	2.61	1.29	0.30	0.80	0.57	22.9
FY 1988	0.00	0.04	1.81	0.53	0.06	3.04	8.94	0.02	0.00	0.00	0.00	0.00	14.4
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.15	2.50	1.49	1.48	1.33	2.55	3.80	5.19	5.67	3.84	3.33	4.80	39.13
FY 1988	1.46	4.11	3.24	0.55	1.06	4.18	8.02	1.46	2.20	4.24	2.86	5.86	39.24
DEVIATION	-1.69	1.61	1.75	-0.93	-0.27	1.63	4.22	-3.73	-3.47	0.40	-0.47	1.06	0.11
POOL ELEVATION													
END OF MONTH	857.13	857.82	858.24	857.85	857.83	860.45	857.90	857.57	857.23	857.02	856.57	856.91	
MAXIMUM	857.48	857.91	858.85	858.24	857.92	860.45	863.52	857.90	857.57	857.32	857.02	856.99	
MINIMUM	857.10	856.95	857.71	857.83	857.70	857.82	857.90	857.57	857.12	857.02	856.57	856.20	
POOL CONTENT-EOM (1000AC.FT)	26.19	27.00	27.50	27.04	27.01	30.20	27.10	26.71	26.31	26.06	25.55	25.94	

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ARKANSAS RIVER BASIN

OOLOGAH LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1981	152.90	138.22	80.40	91.90	84.20	179.83	276.30	289.73	290.68	163.74	51.80	107.14	1906.8
FY 1988	6.26	140.17	407.70	249.12	66.94	463.44	1061.16	57.42	6.72	26.35	6.57	37.13	2529.0
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1988	182.79	157.95	131.19	111.15	120.24	319.12	356.89	218.48	255.48	228.86	47.81	42.77	2172.7
FY 1988	4.93	28.44	244.69	423.37	169.90	390.28	1051.01	158.05	5.37	0.80	0.72	0.48	2478.0
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.14	2.42	1.51	1.45	1.33	2.58	3.70	5.03	5.22	3.61	3.31	4.59	37.89
FY 1988	1.78	3.69	1.57	0.62	0.41	3.44	5.52	1.19	0.59	3.22	2.50	5.29	29.82
DEVIATION	-1.36	1.27	0.06	-0.83	-0.92	0.86	1.82	-3.84	-4.63	-0.39	-0.81	0.70	-8.07
POOL ELEVATION													
END OF MONTH	637.58	640.93	646.57	641.48	638.05	640.08	640.01	636.10	635.30	635.47	634.86	635.69	
MAXIMUM	638.07	641.26	646.57	646.57	641.50	643.46	649.34	640.01	636.17	635.53	635.47	635.72	
MINIMUM	637.38	637.34	637.92	641.35	638.01	637.74	640.01	636.00	635.29	634.95	634.84	634.43	
POOL CONTENT-EOM (1000AC.FT)	541.34	643.74	840.66	661.62	554.92	616.69	614.47	499.13	477.46	482.03	465.67	487.95	

ARKANSAS RIVER BASIN

HULAH LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1918 THRU 1981	26.93	22.70	9.62	9.63	9.35	24.64	40.30	45.44	38.01	29.02	12.81	25.62	294.1
FY 1988	1.45	25.69	73.64	45.82	10.71	93.12	169.09	12.40	1.78	3.11	0.56	14.10	451.5
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1988	40.73	23.73	27.98	14.82	13.82	48.79	52.33	45.89	50.71	27.53	5.86	3.75	355.9
FY 1988	0.18	12.44	50.58	77.23	11.40	79.76	159.84	28.78	1.09	0.31	0.28	7.26	429.2
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.89	2.23	1.38	1.24	1.20	2.22	3.48	4.95	4.67	3.42	3.28	4.17	35.13
FY 1988	1.25	3.74	1.83	0.63	0.29	3.42	6.58	1.79	0.45	3.11	2.44	4.71	30.24
DEVIATION	-1.64	1.51	0.45	-0.61	-0.91	1.20	3.10	-3.16	-4.22	-0.31	-0.84	0.54	-4.89
POOL ELEVATION													
END OF MONTH	732.71	735.76	740.40	733.30	732.96	736.08	737.65	733.24	732.57	732.55	731.74	732.97	
MAXIMUM	732.88	737.15	741.41	740.40	733.38	741.42	752.90	737.65	733.24	732.77	732.55	735.15	
MINIMUM	732.58	732.54	733.08	732.95	732.81	732.96	736.08	732.78	732.57	732.32	731.74	731.37	
POOL CONTENT-EOM (1000AC.FT)	30.15	41.83	63.53	32.26	31.02	43.15	50.05	32.04	29.67	29.60	26.86	31.05	

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ARKANSAS RIVER BASIN

COFAN	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1936 THRU 1977	13.68	13.22	6.94	8.51	7.76	20.51	30.72	34.78	28.28	17.26	4.40	11.59	197.7
FY 1988	0.35	19.55	58.27	33.92	7.10	78.94	159.17	18.07	2.24	3.24	0.60	13.03	394.5
RELEASES(1000AC.FT.)													
AVG 1984 THRU 1988	83.11	29.88	44.47	25.09	16.68	72.81	76.28	47.93	53.61	24.99	2.59	7.73	485.1
FY 1988	0.49	5.41	38.25	62.05	6.57	65.74	139.15	47.21	0.42	0.76	0.98	4.57	371.6
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.04	2.28	1.39	1.33	1.23	2.41	3.51	4.83	4.96	3.44	3.14	3.90	35.46
FY 1988	1.77	4.05	1.72	0.84	0.32	3.85	7.53	1.31	1.18	3.77	2.46	5.58	34.38
DEVIATION	-1.27	1.77	0.33	-0.49	-0.91	1.44	4.02	-3.52	-3.78	0.33	-0.68	1.68	-1.08
POOL ELEVATION													
END OF MONTH	709.26	711.88	715.21	710.12	710.11	712.40	715.36	709.66	709.41	709.37	708.64	710.00	
MAXIMUM	709.67	711.95	715.94	715.21	710.18	715.67	723.76	715.36	709.85	709.54	709.37	710.63	
MINIMUM	709.22	709.07	709.95	709.92	709.90	710.06	712.40	709.32	709.41	709.20	708.64	708.31	
POOL CONTENT-EOM (1000AC.FT)	39.94	53.05	72.51	44.01	43.95	55.90	73.47	41.82	40.64	40.45	37.13	43.42	

ARKANSAS RIVER BASIN

BIRCH LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLWS(1000AC.FT.)													
AVG 1936 THRU 1979	2.40	1.65	1.02	0.96	0.96	3.02	3.18	5.61	3.12	1.78	0.82	1.95	26.5
FY 1988	0.42	1.87	7.98	2.92	0.85	8.09	10.75	0.57	0.41	2.80	0.02	2.65	39.3
RELEASES(1000AC.FT.)													
AVG 1979 THRU 1988	4.22	1.92	1.99	1.62	2.14	5.22	3.86	5.29	3.79	1.05	0.29	0.30	31.7
FY 1988	5.42	0.75	7.54	3.72	0.79	5.82	12.15	0.41	0.40	0.91	0.86	0.64	39.4
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.78	2.16	1.43	1.27	1.33	2.43	3.31	5.00	4.52	3.16	3.29	4.25	34.93
FY 1988	1.00	3.68	2.17	0.67	0.54	2.74	4.74	1.27	1.22	3.66	1.43	7.82	30.89
DEVIATION	-1.78	1.52	0.74	-0.65	-0.79	0.31	1.43	-3.73	-3.30	0.50	-1.86	3.57	-4.04
POOL ELEVATION													
END OF MONTH	750.20	751.01	751.37	750.57	750.52	752.20	750.63	750.29	749.69	750.80	749.38	750.78	
MAXIMUM	754.64	751.34	754.66	751.62	750.82	753.38	758.04	750.63	750.52	750.86	750.80	750.87	
MINIMUM	750.20	749.94	750.47	750.50	750.51	750.07	750.50	750.29	749.69	749.15	749.38	748.22	
POOL CONTENT-EOM (1000AC.FT)	18.84	19.76	20.18	19.26	19.21	21.16	19.33	18.95	18.27	19.52	17.93	19.50	

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ARKANSAS RIVER BASIN

SKIATOOK LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLWS(1000AC.FT.)													
AVG 1935 THRU 1979	13.47	8.09	3.91	3.61	4.29	12.59	15.35	28.43	16.19	10.64	4.09	12.37	133.0
FY 1988	0.88	10.96	44.24	14.37	4.28	41.22	69.11	2.32	0.44	11.45	0.38	12.60	212.4
RELEASES(1000AC.FT.)													
LANE HAS NOT FILLED													
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.88	2.21	1.41	1.37	1.36	2.37	3.30	4.83	4.38	3.24	3.25	4.19	34.74
FY 1988	1.15	4.07	2.12	0.75	0.49	2.79	3.98	1.19	0.66	2.55	1.37	7.68	28.80
DEVIATION	-1.73	1.86	0.71	-0.57	-0.87	0.42	0.68	-3.64	-3.72	-0.69	-1.88	3.49	-5.94
POOL ELEVATION													
END OF MONTH	698.80	699.76	704.56	706.07	706.08	706.72	706.16	705.55	704.35	704.31	702.83	703.19	
MAXIMUM	700.79	699.98	704.56	706.11	706.33	708.52	711.99	706.16	705.55	704.37	704.31	703.31	
MINIMUM	698.73	698.59	698.97	704.56	705.92	705.92	706.16	705.55	704.35	703.50	702.63	702.20	
POOL CONTENT EOM (1000AC.FT)	188.66	195.82	234.11	246.61	247.14	252.79	247.85	242.55	232.34	232.00	219.81	202.74	

ARKANSAS RIVER BASIN

NEWT GRAHAM LOCK AND DAM	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1957	306.03	159.47	104.65	137.73	123.85	203.04	501.27	562.13	549.77	233.60	99.67	117.64	3118.9
FY 1988	57.12	187.93	693.62	731.70	280.46	884.03	1645.88	306.15	33.62	38.68	26.43	83.40	4969.0
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1988	346.44	300.00	270.87	214.23	262.78	559.67	599.92	508.95	477.63	324.13	84.05	88.14	4036.8
FY 1988	57.94	188.08	693.04	731.85	279.86	883.40	1623.33	304.46	34.28	37.91	25.21	83.45	4942.8
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.12	2.36	1.54	1.46	1.47	2.53	3.61	4.88	4.73	3.28	3.20	4.32	36.50
FY 1988	1.31	4.34	2.40	0.81	0.61	4.09	5.14	1.26	0.76	2.82	2.10	6.88	32.52
DEVIATION	-1.81	1.99	0.86	-0.65	-0.86	1.56	1.53	-3.62	-3.97	-0.46	-1.10	2.56	-3.98
POOL ELEVATION													
END OF MONTH	532.24	532.13	532.41	531.90	532.36	532.30	532.16	532.51	532.71	532.69	532.89	532.60	
MAXIMUM	532.99	532.98	533.11	532.94	532.88	533.28	533.05	532.90	532.94	533.03	532.99	533.00	
MINIMUM	532.07	530.44	531.10	531.58	531.59	531.31	531.31	531.55	532.23	532.05	532.27	532.08	
POOL CONTENT-EOM (1000AC.FT)	23.91	23.74	24.17	23.40	24.09	24.00	23.79	24.32	24.62	24.59	24.90	24.46	

ARKANSAS RIVER BASIN

CHOUTEAU LOCK AND DAM	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1957	306.03	159.47	104.65	137.73	123.85	203.31	501.22	562.13	549.77	233.60	99.67	137.64	3119.1
FY 1988	49.39	207.87	745.09	756.89	272.83	939.97	1644.40	313.49	39.77	29.65	19.88	74.18	5093.4
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1988	339.65	305.12	276.97	213.81	264.10	567.26	609.86	511.10	491.87	312.41	77.93	81.82	4051.9
FY 1988	48.65	207.55	744.25	756.85	273.03	939.23	1645.72	312.26	40.60	28.33	18.73	73.72	5088.9
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.40	2.83	2.00	1.90	1.99	2.91	4.15	5.22	5.06	3.06	2.93	4.16	39.61
FY 1988	2.37	4.74	6.01	1.19	1.40	6.46	2.85	2.36	1.26	4.59	2.58	5.58	41.39
DEVIATION	-1.03	1.91	4.01	-0.71	-0.59	3.55	-1.30	-2.86	-3.80	1.53	-0.35	1.42	1.78
POOL ELEVATION													
END OF MONTH	511.50	511.24	511.52	511.46	511.30	511.27	511.49	511.46	511.49	511.49	511.41	511.23	
MAXIMUM	511.54	511.57	511.76	511.56	511.58	511.90	511.62	511.57	511.60	511.60	511.58	511.61	
MINIMUM	511.07	510.96	510.85	511.00	511.14	510.87	510.07	511.07	511.28	511.22	511.28	511.05	
POOL CONTENT-EOM (1000AC.FT)	23.52	22.91	23.57	23.42	24.05	22.98	23.50	23.42	23.50	23.50	23.31	22.88	

ARKANSAS RIVER BASIN

COUNCIL GROVE LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AUG 1922 THRU 1981	5.97	4.43	2.97	2.79	3.75	7.35	10.32	12.52	16.44	12.31	5.02	7.52	91.4
FY 1988	1.05	2.59	6.52	2.30	1.50	2.03	10.61	3.57	1.39	1.46	0.41	0.07	33.5
RELEASES(1000AC.FT.)													
AUG 1976 THRU 1988	6.62	4.04	4.06	1.81	4.03	10.47	12.00	11.45	13.80	12.49	1.87	3.10	85.7
FY 1988	0.25	1.50	5.53	4.46	2.29	0.44	10.80	0.65	0.92	0.43	0.74	0.61	28.6
RAINFALL(INCHES)													
AUG 1930 THRU 1980	2.59	1.63	1.19	0.86	0.91	1.99	3.10	4.60	4.92	3.83	3.54	3.86	33.02
FY 1988	1.94	1.53	0.83	0.25	0.08	0.62	2.92	2.70	2.42	3.03	4.49	1.43	22.24
DEVIATION	-0.65	-0.10	-0.36	-0.61	-0.83	-1.37	-0.18	-1.90	-2.50	-0.80	0.95	-2.43	-10.78
POOL ELEVATION													
END OF MONTH	1273.98	1274.18	1274.41	1274.20	1274.00	1274.26	1273.97	1274.38	1273.94	1273.78	1273.02	1272.42	
MAXIMUM	1273.98	1274.33	1275.31	1274.41	1274.21	1274.26	1276.13	1274.53	1274.38	1274.07	1273.78	1273.02	
MINIMUM	1273.59	1273.98	1273.99	1274.02	1273.94	1273.99	1273.97	1273.94	1273.64	1273.78	1273.02	1272.42	
POOL CONTENT-EOM (1000AC.FT)	18.44	49.10	49.86	49.17	48.51	49.37	48.57	49.94	48.47	47.95	45.49	43.62	

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ARKANSAS RIVER BASIN

MARION LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AUG 1938 THRU 1971	3.16	1.28	1.49	1.94	2.08	3.31	5.91	8.70	10.17	7.13	1.78	4.79	51.7
FY 1988	0.75	1.10	4.08	1.32	0.57	1.42	4.82	5.26	1.98	1.92	0.93	0.16	24.2
RELEASES(1000AC.FT.)													
AUG 1976 THRU 1988	3.32	3.88	3.75	1.86	2.55	5.12	7.55	8.00	6.61	8.28	2.16	1.58	54.7
FY 1988	0.43	0.19	10.31	2.19	0.06	0.06	0.15	0.42	0.53	0.55	0.55	0.54	16.0
RAINFALL(INCHES)													
AUG 1930 THRU 1980	2.50	1.57	1.07	0.80	0.96	1.88	2.75	4.45	4.68	3.82	3.26	3.73	31.47
FY 1988	2.09	0.41	0.72	0.12	0.05	0.41	2.72	4.66	3.00	2.58	5.59	0.79	23.14
DEVIATION	-0.41	-1.16	-0.35	-0.68	-0.91	-1.47	-0.03	0.21	-1.68	-1.24	2.33	-2.94	-8.33
POOL ELEVATION													
END OF MONTH	1349.87	1349.86	1348.70	1348.47	1348.52	1348.49	1348.98	1349.31	1348.93	1348.64	1348.14	1347.66	
MAXIMUM	1350.50	1349.87	1349.86	1348.70	1348.57	1348.56	1349.01	1349.37	1349.35	1348.97	1348.72	1348.14	
MINIMUM	1349.79	1349.72	1348.67	1348.47	1348.47	1348.48	1348.49	1348.82	1348.68	1348.59	1348.14	1347.59	
POOL CONTENT-EOM (1000AC.FT)	79.88	79.81	73.04	71.74	71.02	71.85	71.38	73.36	71.09	69.41	66.50	63.82	

ARKANSAS RIVER BASIN

JOHN REDMOND DAM AND RES	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1922 THRU 1981	71.02	55.44	38.04	36.84	40.33	87.60	126.29	136.01	165.24	118.01	39.59	70.27	984.7
FY 1988	19.42	40.80	116.49	48.10	23.50	46.19	248.13	43.14	19.93	22.71	4.01	5.26	637.7
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1988	81.63	72.63	54.45	30.62	57.24	127.09	170.97	140.92	164.17	132.60	36.06	39.98	1108.4
FY 1988	10.04	13.74	126.75	80.40	22.86	42.78	246.02	38.98	15.54	16.50	9.11	6.46	629.2
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.63	1.69	1.18	0.90	0.96	2.06	2.99	4.44	4.89	3.82	3.40	4.04	33.00
FY 1988	2.21	1.02	0.61	0.16	0.04	0.72	3.11	1.66	1.72	3.04	4.44	1.35	20.08
DEVIATION	-0.42	-0.67	-0.57	-0.74	-0.92	-1.34	0.12	-2.78	-3.17	-0.78	1.04	-2.69	-12.92
POOL ELEVATION													
END OF MONTH	1040.29	1042.77	1042.05	1039.08	1039.11	1039.43	1039.23	1039.18	1039.05	1039.26	1038.22	1037.73	
MAXIMUM	1040.29	1042.85	1047.12	1042.23	1039.19	1039.91	1052.08	1039.64	1039.18	1039.73	1039.26	1038.22	
MINIMUM	1038.97	1040.29	1041.51	1038.89	1038.87	1038.90	1038.91	1038.98	1038.68	1039.05	1038.22	1037.56	
POOL CONTENT-EDM (1000AC.FT)	83.63	110.04	101.94	72.04	72.32	75.34	66.50	66.01	64.74	66.80	56.75	52.21	

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ARKANSAS RIVER BASIN

PENSACOLA LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1981	322.60	323.22	236.46	249.34	281.52	462.47	648.79	692.47	729.00	403.86	171.64	260.79	4782.2
FY 1988	62.28	622.91	1363.74	467.90	298.11	861.82	1519.93	162.05	75.77	160.46	56.13	115.04	5766.1
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1988	405.14	428.53	416.84	293.84	368.34	652.83	781.33	499.27	502.91	443.36	211.13	191.48	5195.0
FY 1988	59.07	335.93	1209.80	820.07	342.29	618.58	1599.55	202.45	67.87	133.13	80.79	77.71	5547.2
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.39	2.71	1.89	1.73	1.73	2.91	4.02	5.15	5.26	3.58	3.39	4.64	40.40
FY 1988	2.12	4.25	1.65	0.37	0.74	3.36	3.73	0.97	1.51	2.99	3.37	5.36	30.42
DEVIATION	-1.27	1.54	-0.24	-1.36	-0.99	0.45	-0.29	-4.18	-3.75	-0.59	-0.02	0.72	-9.98
POOL ELEVATION													
END OF MONTH	740.17	746.44	749.47	741.87	740.70	745.86	744.00	742.66	742.29	742.49	741.44	742.58	
MAXIMUM	740.34	747.83	750.96	749.47	741.87	746.10	749.57	744.00	742.83	742.83	742.49	742.80	
MINIMUM	739.90	739.80	742.39	741.87	740.63	740.46	744.00	742.37	742.17	742.29	741.41	741.00	
POOL CONTENT-EDM (1000AC.FT)	1459.14	1740.12	1889.97	1531.41	1481.40	1712.42	1626.00	1566.04	1549.76	1558.56	1512.92	1562.52	

ARKANSAS RIVER BASIN

LAKE HUDSON	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1981	366.07	326.50	276.23	277.65	316.68	493.77	703.76	798.60	797.85	469.55	232.23	292.51	5351.4
FY 1988	64.36	428.83	1501.29	873.42	392.53	783.27	1784.63	220.17	74.18	144.02	80.03	92.53	6439.3
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1988	437.79	494.14	489.36	346.02	424.89	764.89	945.43	588.92	616.78	470.24	214.65	205.87	5999.0
FY 1988	57.54	422.80	1423.99	957.96	384.24	764.11	1802.38	212.43	66.60	130.31	79.46	92.13	6394.0
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.78	3.02	2.17	1.94	2.08	3.16	4.26	5.47	5.21	3.23	3.42	4.66	42.40
FY 1988	2.45	5.03	3.22	0.42	0.84	4.89	3.23	1.13	0.51	1.49	1.87	4.98	30.06
DEVIATION	-1.33	2.01	1.05	-1.52	-1.24	1.73	-1.03	-4.34	-4.70	-1.74	-1.55	0.32	-12.34
POOL ELEVATION													
END OF MONTH	619.47	619.82	626.03	618.93	619.63	621.08	619.14	619.41	619.51	619.71	619.49	619.17	
MAXIMUM	619.58	621.57	627.32	626.03	620.19	621.71	626.91	619.58	619.83	619.93	619.93	620.15	
MINIMUM	618.63	618.52	618.80	618.53	618.93	614.31	618.92	618.92	618.97	619.09	619.21	618.92	
POOL CONTENT-EOM (1000AC.FT)	205.49	209.36	285.63	199.55	207.26	223.68	201.85	204.83	205.94	208.15	205.71	202.18	

VII-16

ARKANSAS RIVER BASIN

FORT GIBSON LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1980	392.66	377.51	305.41	312.54	355.69	546.77	797.48	887.79	880.74	507.86	248.96	323.89	5937.3
FY 1988	78.05	524.73	1738.71	1042.11	407.21	969.52	1895.11	224.13	72.85	124.58	70.26	88.07	7235.3
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1988	500.51	514.58	543.71	407.43	393.29	858.74	1032.30	637.25	636.67	514.73	206.42	197.67	6443.3
FY 1988	76.60	430.44	1411.20	1416.31	412.27	904.22	1974.17	214.24	61.06	114.70	52.14	88.70	7156.0
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.63	2.90	2.16	1.97	2.13	3.14	4.26	5.40	5.12	3.05	3.21	4.39	41.36
FY 1988	2.40	4.95	4.47	0.77	1.01	5.46	2.52	1.54	0.88	3.77	1.68	5.49	34.94
DEVIATION	-1.23	2.05	2.31	-1.20	-1.12	2.32	-1.74	-3.86	-4.24	0.72	-1.53	1.10	-6.42
POOL ELEVATION													
END OF MONTH	553.94	558.35	570.08	555.90	555.51	558.30	554.00	554.04	554.11	554.10	554.56	554.18	
MAXIMUM	554.51	559.02	571.95	570.08	555.90	559.21	568.63	554.36	554.70	554.97	554.87	554.89	
MINIMUM	553.12	553.51	553.68	554.04	553.32	553.56	554.00	553.06	553.85	553.94	553.82	553.80	
POOL CONTENT-EOM (1000AC.FT)	364.08	454.84	780.27	402.50	394.70	453.72	365.20	365.97	367.32	367.13	376.01	368.67	

ARKANSAS RIVER BASIN

WERRERS FALLS L&D	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLWS(1000AC.FT.)													
AUG 1940 THRU 1981	1163.75	1067.84	732.82	668.85	751.95	1291.80	1905.47	2350.06	1996.12	1593.36	687.71	627.23	14837.0
FY 1988	555.77	875.31	3218.18	3522.05	1145.06	3682.51	6346.71	1173.62	291.17	313.59	181.29	346.31	21651.6
RELEASES(1000AC.FT.)													
AUG 1976 THRU 1988	1524.88	1299.28	1182.85	947.94	985.61	2336.13	2630.88	2053.92	2089.63	1342.10	477.21	483.24	17353.7
FY 1988	555.06	871.81	3216.27	3517.86	1147.26	3673.26	6343.41	1168.50	284.05	307.67	189.89	340.69	21615.7
RAINFALL(INCHES)													
AUG 1930 THRU 1980	3.41	2.83	2.08	1.41	2.12	2.97	4.26	5.28	5.09	3.01	2.94	4.21	39.61
FY 1988	2.66	3.93	3.72	0.89	0.80	5.12	2.18	1.55	1.19	4.58	1.65	5.65	33.92
DEVIATION	-0.75	1.10	1.64	-0.52	-1.32	2.15	-2.08	-3.73	-3.90	1.57	-1.29	1.44	-5.69
POOL ELEVATION													
END OF MONTH	489.81	489.90	489.88	490.07	489.67	490.24	490.17	490.02	489.98	489.96	488.77	488.84	
MAXIMUM	490.54	490.54	490.85	490.74	490.56	490.51	490.84	490.35	490.31	490.71	490.27	490.33	
MINIMUM	488.95	489.13	468.97	489.57	488.85	488.92	489.88	488.78	488.34	489.50	488.77	487.32	
POOL CONTENT-EOM (1000AC.FT)	167.95	168.97	168.74	170.96	166.35	173.02	172.17	170.35	169.88	169.65	156.25	157.01	

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ARKANSAS RIVER BASIN

TENKILLER LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLWS(1000AC.FT.)													
AUG 1923 THRU 1981	52.66	73.08	76.11	82.05	97.10	136.73	174.34	188.34	119.59	53.49	40.27	35.47	1129.2
FY 1988	24.20	110.98	443.50	145.88	68.92	337.09	202.91	43.83	20.83	21.03	10.74	12.46	1442.4
RELEASES(1000AC.FT.)													
AUG 1976 THRU 1988	63.05	56.30	96.83	99.88	56.36	110.26	156.50	101.29	72.93	51.76	41.98	26.61	933.8
FY 1988	35.34	54.52	218.65	369.32	105.22	228.85	266.19	92.94	9.89	5.22	31.89	7.27	1425.3
RAINFALL(INCHES)													
AUG 1930 THRU 1980	3.62	3.17	2.58	2.22	2.66	3.52	4.59	5.65	4.89	3.15	3.29	4.32	43.66
FY 1988	2.83	3.28	3.07	0.48	0.68	4.33	1.60	1.10	0.69	1.79	1.91	2.79	24.55
DEVIATION	-0.79	0.11	0.49	-1.74	-1.98	0.81	-2.99	-4.55	-4.20	-1.36	-1.38	-1.53	-19.11
POOL ELEVATION													
END OF MONTH	629.87	634.37	649.59	634.24	631.39	639.17	634.32	630.08	630.48	631.25	629.10	629.14	
MAXIMUM	631.14	634.40	650.92	649.59	634.24	639.17	641.24	634.32	630.74	631.26	631.26	629.15	
MINIMUM	629.79	629.50	633.11	634.24	631.34	631.38	634.32	629.22	630.08	630.48	629.10	628.83	
POOL CONTENT-EOM (1000AC.FT)	627.10	685.15	908.71	683.44	646.11	750.96	684.49	629.68	634.60	644.27	617.63	618.12	

CONCHAS LAKE

InFlows (1000 Ac-Ft.)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Avg 1940 thru 1988	9.70	3.84	3.66	3.80	4.18	4.30	15.69	29.02	24.06	23.78	27.67	20.94	170.64
FY 1988	1.37	2.92	3.62	3.64	4.43	3.97	5.29	3.85	12.72	13.84	14.82	17.35	87.82

Releases (1000 Ac-Ft.)

Avg 1941 thru 1988	8.28	1.89	1.61	.65	1.05	2.39	14.58	18.42	15.57	17.64	18.08	19.82	119.98
FY 1988	10.25	1.74	.02	.04	.06	1.57	7.42	10.29	6.44	10.32	13.31	4.73	66.19

Rainfall (Inches)

Avg 1940 thru 1988	1.07	.52	.46	.34	.41	.62	.86	1.63	1.67	2.38	2.42	1.33	13.66
FY 1988	.04	.90	.80	.13	0	.49	1.74	2.33	4.52	4.24	1.65	2.42	19.26

Pool Elevation (EOM)

Maximum	4197.98	4197.75	4197.98	4198.20	4198.43	4198.18	4197.27	4195.90	4196.07	4195.97	4195.68	4196.78	
Minimum	4199.40	4197.73	4197.99	4198.18	4198.44	4198.46	4198.20	4197.21	4196.34	4196.65	4195.90	4196.84	
	4197.98	4197.72	4197.75	4197.98	4198.20	4198.18	4197.27	4195.90	4195.51	4196.05	4195.39	4195.70	

Pool Content (EOM)

(1000 Ac-Ft.)	301.90	299.84	301.90	289.71	291.78	289.53	281.49	269.66	271.10	270.25	267.80	277.18	
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VII-18

ARKANSAS RIVER BASIN

SANFORD RESERVOIR

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
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INFLOWS(1000AC.FT.)

Avg 1923 THRU 1981	21.36	3.42	1.97	3.18	2.09	2.58	11.47	35.88	38.51	37.66	35.93	30.86	224.9
FY 1988	1.45	0.45	0.52	3.25	2.12	4.99	11.11	15.20	35.76	33.61	5.93	36.81	151.2

RELEASES(1000AC.FT.)

LAKE HAS NOT FILLED													
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RAINFALL(INCHES)

Avg 1930 THRU 1980	1.32	0.60	0.49	0.45	0.48	0.68	1.14	2.52	2.36	2.68	2.48	1.62	16.82
FY 1988	0.96	0.22	0.31	0.12	0.03	0.40	1.04	2.83	2.98	2.46	1.66	4.36	17.37
DEVIATION	-0.36	-0.38	-0.18	-0.33	-0.45	-0.28	-0.10	0.31	0.62	-0.22	-0.82	2.74	0.55

POOL ELEVATION

END OF MONTH	2898.25	2897.63	2897.34	2897.10	2896.68	2896.35	2896.39	2896.75	2899.14	2901.25	2900.37	2903.05	
MAXIMUM	2899.04	2898.27	2897.63	2897.36	2897.11	2896.77	2896.60	2896.75	2899.19	2901.62	2901.25	2903.06	
MINIMUM	2898.25	2897.62	2897.33	2897.10	2896.68	2896.35	2896.27	2895.79	2896.75	2899.10	2900.27	2900.11	

POOL CONTENT-EOM

(1000AC.FT.)	339.33	333.49	330.77	328.52	324.63	321.59	321.95	325.28	347.82	368.47	359.77	386.72	
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ARKANSAS RIVER BASIN

NORMAN RESERVOIR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AUG 1926 THRU 1961	3.80	0.90	1.60	1.10	2.10	4.20	9.50	13.70	12.10	4.40	0.70	2.40	56.5
FY 1988	0.14	2.25	9.76	3.83	2.79	27.99	29.84	2.98	3.89	0.56	0.85	4.49	89.4
RELEASES(1000AC.FT.)													
AUG 1976 THRU 1988	3.91	4.48	1.44	2.68	2.11	6.15	6.69	4.34	6.76	1.54	0.00	0.00	40.1
FY 1988	0.00	0.00	0.00	0.00	2.12	14.60	35.32	2.63	0.00	0.00	0.00	0.00	54.7
RAINFALL(INCHES)													
AUG 1930 THRU 1980	2.89	2.07	1.51	1.32	1.54	2.23	3.48	5.50	4.35	2.70	2.60	3.48	33.67
FY 1988	1.88	1.52	3.13	0.77	0.70	5.19	5.35	0.52	3.51	1.17	2.55	6.48	32.77
DEVIATION	-1.01	-0.55	1.62	-0.55	-0.84	2.96	1.87	-4.98	-0.84	-1.53	-0.05	3.00	-0.90
POOL ELEVATION													
END OF MONTH	1037.75	1037.75	1039.05	1039.39	1039.17	1040.85	1039.44	1038.75	1038.54	1037.77	1036.97	1037.15	
MAXIMUM	1038.21	1037.78	1039.05	1039.39	1039.40	1041.05	1044.36	1039.44	1038.85	1038.54	1037.77	1037.19	
MINIMUM	1037.30	1037.55	1037.72	1039.05	1039.00	1039.01	1039.44	1038.73	1038.35	1037.77	1036.97	1036.53	
POOL CONTENT-EOM													
(1000AC.FT)	112.15	112.15	119.90	121.98	120.64	131.22	122.28	118.10	116.84	112.27	107.63	108.67	

VII-19

ARKANSAS RIVER BASIN

OPTIMA LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AUG 1939 THRU 1981	2.10	0.82	0.96	0.89	1.05	1.05	1.57	5.60	6.75	3.77	3.36	3.30	31.2
FY 1988	0.00	0.04	0.02	0.02	0.04	0.11	0.30	0.01	0.02	2.04	0.00	1.24	3.8
RELEASES(1000AC.FT.)													
LAKE HAS NOT FILLED													
RAINFALL(INCHES)													
AUG 1930 THRU 1980	1.13	0.59	0.40	0.37	0.42	0.77	1.23	2.64	2.25	2.69	2.41	1.62	16.52
FY 1988	0.05	0.28	0.19	0.20	0.03	0.40	0.87	1.98	0.88	2.18	0.94	2.92	10.92
DEVIATION	-1.08	-0.31	-0.21	-0.17	-0.39	-0.37	-0.36	-0.66	-1.37	-0.51	-1.47	1.30	-5.60
POOL ELEVATION													
END OF MONTH	2712.95	2712.85	2712.80	2712.80	2712.80	2712.90	2713.50	2712.95	2712.30	2716.70	2715.85	2717.40	
MAXIMUM	2713.35	2712.95	2712.85	2712.80	2712.80	2712.90	2713.50	2713.50	2712.95	2717.05	2716.70	2717.55	
MINIMUM	2712.95	2712.85	2712.80	2712.80	2712.80	2712.80	2712.90	2712.90	2712.30	2712.05	2715.80	2715.82	
POOL CONTENT-EOM													
(1000AC.FT)	0.75	0.72	0.71	0.71	0.71	0.74	0.91	0.75	0.60	2.28	1.82	2.71	

ARKANSAS RIVER BASIN

FORT SUPPLY LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1981	5.96	3.34	1.83	1.92	3.26	3.01	4.63	12.05	11.42	4.28	3.50	3.59	58.8
FY 1988	3.17	3.17	4.95	5.12	4.32	9.54	8.90	5.73	4.65	3.14	1.55	2.67	56.9
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1988	1.72	1.29	1.33	1.81	2.22	3.20	3.27	8.25	3.85	0.95	0.47	0.66	29.0
FY 1988	4.70	3.27	4.05	5.47	4.26	8.74	8.06	4.20	3.28	2.53	0.06	2.00	50.6
RAINFALL(INCHES)													
AVG 1930 THRU 1980	1.60	0.94	0.67	0.57	0.80	1.13	1.73	3.66	3.06	2.44	2.45	1.82	20.87
FY 1988	0.84	0.18	0.64	0.42	0.01	2.21	1.93	0.19	1.90	1.62	1.75	2.73	14.42
DEVIATION	-0.76	-0.76	-0.03	-0.15	-0.79	1.08	0.20	-3.47	-1.16	-0.82	-0.70	0.91	-6.45
POOL ELEVATION													
END OF MONTH	2004.10	2003.88	2004.21	2003.91	2003.81	2003.99	2004.00	2004.21	2004.26	2003.98	2004.12	2004.00	
MAXIMUM	2005.19	2004.19	2004.37	2004.21	2004.08	2004.50	2004.23	2004.21	2004.65	2004.31	2004.14	2004.29	
MINIMUM	2003.85	2003.71	2003.85	2003.79	1003.81	2003.77	2003.82	2003.79	2003.82	2003.93	2003.91	2003.88	
POOL CONTENT-EOM (1000AC.FT)	14.08	13.67	14.30	13.73	13.55	13.87	13.89	14.30	14.39	13.85	14.12	13.89	

VII-20

ARKANSAS RIVER BASIN

CANTON LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1981	18.09	5.83	3.94	4.22	5.63	8.35	13.59	34.74	36.74	27.60	9.76	11.25	179.7
FY 1988	8.49	7.54	12.08	15.89	11.70	30.86	28.55	19.00	12.21	12.16	4.52	3.88	166.9
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1988	3.30	5.08	5.94	4.14	3.63	7.21	12.85	5.63	14.01	8.34	5.62	5.72	81.5
FY 1988	8.45	5.86	11.74	14.16	12.16	26.13	27.72	13.22	7.22	38.34	4.52	0.37	169.9
RAINFALL(INCHES)													
AVG 1930 THRU 1980	1.46	0.91	0.60	0.54	0.71	1.13	1.64	3.37	2.80	2.56	2.49	1.79	20.00
FY 1988	0.34	0.24	0.38	0.23	0.01	1.13	1.65	0.87	1.49	1.89	1.31	2.09	11.63
DEVIATION	-1.12	-0.67	-0.22	-0.31	-0.70	0.00	0.01	-2.50	-1.31	-0.67	-1.18	0.30	-8.37
POOL ELEVATION													
END OF MONTH	1615.48	1615.50	1615.38	1615.57	1615.42	1615.72	1615.45	1615.66	1615.71	1611.58	1610.98	1611.10	
MAXIMUM	1616.05	1615.50	1615.78	1615.90	1615.65	1616.07	1616.49	1615.72	1615.73	1615.86	1611.58	1611.55	
MINIMUM	1615.42	1615.29	1615.38	1615.25	1615.27	1615.21	1615.36	1615.32	1615.29	1611.58	1610.98	1610.80	
POOL CONTENT-EOM (1000AC.FT)	111.99	112.15	111.19	112.70	111.51	113.89	111.75	113.42	113.91	83.27	79.22	80.02	

ARKANSAS RIVER BASIN

ARCADIA LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1938 THRU 1982	1.91	1.63	0.96	1.36	1.39	2.43	3.60	7.60	5.08	2.06	1.03	1.99	28.1
FY 1988	1.63	1.85	4.51	3.04	1.11	10.01	7.59	1.78	3.40	1.98	1.04	3.94	41.9
RELEASES(1000AC.FT.)													
LAKE HAS NOT FILLED													
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.74	1.93	1.47	1.24	1.45	2.16	3.22	5.32	4.25	2.77	2.55	3.38	32.48
FY 1988	1.22	1.92	1.85	1.16	0.43	5.11	4.23	3.25	2.67	2.12	2.53	5.08	31.57
DEVIATION	-1.52	-0.01	0.38	-0.08	-1.02	2.95	1.01	-2.07	-1.58	-0.65	-0.02	1.70	-0.91
POOL ELEVATION													
END OF MONTH	998.60	998.19	1000.23	1002.13	1002.01	1003.34	1001.92	1001.89	1003.17	1002.18	1002.10	1002.61	
MAXIMUM	998.69	998.60	1000.23	1002.13	1002.13	1005.36	1005.31	1002.31	1003.27	1003.22	1002.20	1002.79	
MINIMUM	997.99	997.91	997.98	1000.23	1001.92	1001.90	1001.85	1001.81	1001.82	1001.83	1001.97	1001.99	
POOL CONTENT-EDM (1000AC.FT)	15.91	15.37	18.17	21.03	20.84	22.97	20.70	20.65	22.69	21.11	20.98	21.79	

ARKANSAS RIVER BASIN

EUFAULA LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1923 THRU 1981	332.38	246.54	202.92	218.39	262.49	353.60	526.38	766.88	603.75	252.71	144.26	212.12	4122.4
FY 1988	45.22	286.21	1375.14	494.08	204.89	1095.87	1141.49	125.16	79.73	155.70	31.73	82.71	5117.9
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1988	155.41	249.26	235.70	308.74	220.25	430.07	397.49	493.25	540.48	237.64	147.83	60.58	3476.7
FY 1988	84.86	77.84	627.59	1146.92	359.98	882.75	1171.45	294.35	21.59	8.79	105.30	22.80	4804.2
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.15	2.45	1.89	1.64	1.98	2.72	3.85	5.54	4.42	3.03	2.80	3.90	37.37
FY 1988	2.04	2.88	3.15	0.89	0.70	4.33	3.43	0.65	1.41	3.76	1.67	4.80	29.71
DEVIATION	-1.11	0.43	1.26	-0.75	-1.28	1.61	-0.42	-4.89	-3.01	0.73	-1.13	0.90	-7.66
POOL ELEVATION													
END OF MONTH	583.87	585.66	591.89	586.29	584.68	586.40	585.77	583.64	583.61	584.47	583.12	583.35	
MAXIMUM	584.60	585.68	592.99	591.89	586.30	587.68	590.57	585.86	583.78	584.48	584.50	583.36	
MINIMUM	583.84	583.67	585.14	586.29	584.68	584.60	585.75	583.49	583.61	583.59	583.12	582.72	
POOL CONTENT-EDM (1000AC.FT)	2197.77	2385.39	3118.64	2454.04	2281.35	2466.24	2397.20	2174.76	2171.76	2259.56	2122.74	2145.74	

ARKANSAS RIVER BASIN

R.S.KERR LOCK AND DAM	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AUG 1943 THRU 1981	1283.00	1231.74	1064.24	964.67	1176.02	1963.52	2466.04	3141.04	2757.85	2170.09	986.93	1279.80	20484.9
FY 1988	712.07	1095.07	4336.07	5035.83	1671.47	4943.80	7676.43	1600.07	334.21	347.90	339.77	397.09	28489.8
RELEASES(1000AC.FT.)													
AUG 1976 THRU 1988	1815.64	1671.76	1618.68	1414.17	1322.17	2970.04	3285.93	2805.80	2781.44	1602.81	662.53	568.77	22519.7
FY 1988	677.38	1102.52	4335.18	5046.16	1648.23	4963.68	7615.94	1584.22	299.10	330.96	327.44	413.38	28344.2
RAINFALL(INCHES)													
AUG 1930 THRU 1980	3.60	3.07	2.57	2.13	2.61	3.43	4.54	5.61	4.69	3.16	3.15	4.19	42.75
FY 1988	2.54	4.73	5.81	0.78	0.94	4.28	2.17	1.18	1.14	3.73	1.80	3.78	32.88
DEVIATION	-1.06	1.66	3.24	-1.35	-1.67	0.85	-2.37	-4.43	-3.55	0.57	-1.35	-0.41	-9.87
POOL ELEVATION													
END OF MONTH	460.14	459.78	459.67	459.30	459.69	459.00	460.00	459.89	460.18	460.05	459.95	459.20	
MAXIMUM	460.38	460.60	461.16	460.41	460.38	460.80	460.60	460.25	460.25	460.37	460.40	460.23	
MINIMUM	458.62	459.20	458.80	458.25	458.72	458.98	458.30	458.20	459.70	459.93	458.96	459.04	
POOL CONTENT-EOM (1000AC.FT)	532.00	516.20	511.46	495.52	512.33	482.59	525.69	520.95	533.81	527.94	523.53	491.21	

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ARKANSAS RIVER BASIN

W.D. MAYO LOCK AND DAM	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AUG 1943 THRU 1981	1286.93	1308.95	1072.34	1000.13	1200.22	2018.50	2575.19	3157.14	2710.16	2122.46	974.74	1253.55	20680.3
FY 1988	664.46	1102.61	4362.64	5097.72	1660.96	4949.95	7642.91	1564.36	287.80	310.81	307.44	416.53	28368.2
RELEASES(1000AC.FT.)													
AUG 1976 THRU 1988	1892.39	1703.37	1661.71	1466.24	1363.58	3042.76	3308.96	2763.39	2843.18	1635.94	697.15	596.42	22975.1
FY 1988	663.43	1106.56	4359.48	5100.34	1660.89	4950.27	7641.64	1563.32	287.00	310.37	306.29	416.34	28365.9
RAINFALL(INCHES)													
AUG 1930 THRU 1980	3.39	3.32	2.71	2.24	2.80	3.65	4.46	5.53	4.32	3.16	2.99	4.09	42.66
FY 1988	3.45	5.94	6.71	0.61	1.19	3.99	3.59	1.65	0.91	2.83	1.91	3.18	35.96
DEVIATION	0.06	2.62	4.00	-1.63	-1.61	0.34	-0.87	-3.88	-3.41	-0.33	-1.08	-0.91	-6.70
POOL ELEVATION													
END OF MONTH	412.82	412.43	414.30	412.58	412.42	411.56	412.24	412.34	412.57	412.30	412.60	412.33	
MAXIMUM	413.17	413.66	416.46	414.42	413.02	412.90	415.08	413.08	413.06	413.11	413.06	413.27	
MINIMUM	411.89	408.99	411.06	411.29	411.78	410.89	410.91	412.06	410.09	411.93	412.03	411.53	
POOL CONTENT-EOM (1000AC.FT)	15.48	14.86	17.90	15.10	14.85	13.56	14.56	14.72	15.09	14.66	15.13	14.70	

ARKANSAS RIVER BASIN

WISTER LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AUG 1938 THRU 1981	18.76	50.47	65.96	67.53	93.38	126.43	132.44	134.46	60.21	21.41	9.21	17.46	797.7
FY 1988	1.94	53.40	350.88	67.54	61.94	102.19	150.61	5.39	0.90	2.84	11.63	5.28	814.5
RELEASES(1000AC.FT.)													
AUG 1976 THRU 1988	17.62	39.88	109.74	83.19	73.70	114.86	88.70	103.30	91.51	15.97	4.85	3.51	746.8
FY 1988	1.07	36.26	114.46	331.51	63.91	90.54	157.52	11.38	1.06	0.93	2.80	5.73	817.2
RAINFALL(INCHES)													
AUG 1930 THRU 1980	3.43	3.56	3.15	2.71	3.16	4.00	4.65	5.87	4.08	3.55	3.28	4.16	45.60
FY 1988	2.36	3.39	4.12	0.27	0.98	2.06	1.89	1.25	1.33	2.41	2.04	2.26	24.36
DEVIATION	-1.07	-0.17	0.97	-2.44	-2.18	-1.94	-2.76	-4.62	-2.75	-1.14	-1.24	-1.90	-21.24
POOL ELEVATION													
END OF MONTH	477.68	479.73	496.98	475.43	474.93	476.67	475.98	474.49	473.89	473.81	475.08	474.69	
MAXIMUM	477.89	480.19	497.46	496.98	478.05	478.27	485.75	475.98	474.59	473.89	475.49	475.31	
MINIMUM	477.61	477.58	477.90	475.43	474.48	474.71	475.98	474.45	473.89	473.40	473.58	474.46	
POOL CONTENT-EOM (1000AC.FT)	60.12	75.99	311.42	45.73	42.87	53.27	48.90	40.53	37.40	37.01	43.70	41.59	

ARKANSAS RIVER BASIN

JAMES V. TRIMBLE L. & D.
Releases (1,000 AC. FT.)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Avg 1971 thru 1988	1965.4	2466.5	2261.8	1884.7	1818.3	3638.8	3584.4	3263.7	3256.4	1588.1	701.2	729.4	27158.7
WY 1988	747.9	1255.5	4856.0	5665.6	2129.5	5154.9	7922.8	1602.2	275.9	272.5	337.0	416.0	30635.8

Project Rainfall (Inches)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Avg 1972 thru 1988	4.1	4.8	3.1	1.7	2.5	4.5	3.4	4.4	3.7	3.1	2.5	3.4	41.2
WY 1988	3.5	4.8	10.9	.5	1.9	7.9	8.0	1.3	2.2	1.6	.4	2.1	45.1
Deviation	-6	.0	7.8	-1.2	-6	3.4	4.6	-3.1	-1.5	-1.5	-2.1	-1.3	3.9

Pool Elevation

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
End of Month	392.03	391.93	389.98	391.78	391.50	389.11	389.76	392.14	392.33	391.75	391.98	392.69	
Maximum	392.25	392.30	393.47	391.78	392.13	391.92	391.40	393.01	392.46	392.50	392.54	394.22	
Minimum	391.31	390.01	388.73	388.66	391.18	388.75	388.46	389.62	391.59	391.37	391.07	390.47	

Pool Content EOM
(1,000 AC. FT.)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	59.3	58.6	46.3	57.6	55.8	41.6	45.1	60.1	61.4	57.5	59.0	63.9	

OZARK-JETA TAYLOR LAKE
Releases (1,000 AC. FT.)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Avg 1972 thru 1988	2019.2	2805.6	2616.4	2004.0	2010.8	4072.8	4017.2	3555.4	3451.2	1665.1	738.9	756.8	29713.4
WY 1988	699.0	1265.5	5254.6	5645.8	2172.8	5231.3	8119.7	1696.4	328.0	370.0	362.2	438.7	31584.0

Project Rainfall (Inches)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Avg 1973 thru 1988	4.0	5.1	3.8	2.0	2.9	4.6	3.3	5.2	4.1	3.2	2.6	3.6	44.4
WY 1988	1.3	4.5	8.3	.9	2.0	4.8	2.1	2.4	1.3	4.0	1.4	2.2	35.2
Deviation	-2.7	-6	4.5	-1.1	-9	.2	-1.2	-2.8	-2.8	.8	-1.2	-1.4	-9.2

Pool Elevation

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
End of Month	371.85	371.37	372.06	370.90	370.80	371.80	371.86	372.31	372.49	371.16	371.47	372.21	
Maximum	372.30	372.33	372.36	372.36	372.45	372.40	372.19	372.58	372.64	372.49	372.22	372.21	
Minimum	369.95	370.20	370.20	370.90	370.42	370.40	371.32	370.99	371.24	371.00	370.38	370.32	

Pool Content EOM
(1,000 AC. FT.)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	146.9	142.3	149.1	137.7	136.8	146.5	147.0	152.0	154.1	140.3	143.3	150.9	

ARKANSAS RIVER BASIN

DARDANELLE LAKE

Releases (1,000 AC. FT.)

Avg 1946 thru 1968

WY 1968

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	1822.8	2360.4	2385.5	1917.8	1955.8	3485.8	3698.2	3489.0	3567.3	1616.6	813.7	785.5	27898.4
	731.5	1224.8	5603.9	6096.0	2318.9	5555.0	8229.1	1680.1	304.2	345.8	330.3	425.4	32845.0

Project Rainfall (inches)

Avg 1971 thru 1988

WY 1988

Deviation

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
4.6	5.0	4.7	2.3	3.1	4.9	4.1	5.5	4.1	2.6	2.8	3.7	47.4	
2.2	5.7	6.5	.8	1.8	3.9	4.9	1.8	1.1	4.6	1.5	2.6	37.4	
-2.4	.7	1.8	-1.5	-1.3	-1.0	.8	-3.7	-3.0	2.0	-1.3	-1.1	-10.0	

Pool Elevation

End of Month

Maximum

Minimum

337.51	338.00	337.62	337.76	337.78	337.87	337.60	337.62	337.57	337.98	337.68	337.70
338.17	338.34	338.37	338.21	338.31	338.29	338.13	338.20	338.05	338.27	337.98	338.08
337.35	337.06	337.06	337.62	337.44	337.39	337.50	337.37	337.22	337.24	337.10	337.08

Pool Content EOM

(1,000 AC. FT.)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
469.8	486.2	473.5	478.2	478.8	481.8	472.8	473.5	471.8	485.5	475.5	476.2	476.2	

BLUE MOUNTAIN LAKE

Inflows (1,000 AC. FT.)

Avg 1948 thru 1968

WY 1968

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	11.7	24.5	37.2	41.8	46.1	63.2	55.3	53.9	16.4	9.9	4.8	4.6	369.4
	.1	11.7	147.2	39.2	43.5	40.6	67.2	2.4	1.8	2.7	.7	.5	357.6

Releases (1,000 AC. FT.)

Avg 1948 thru 1968

WY 1968

5.6	14.7	36.3	40.3	43.1	49.5	45.0	50.3	35.9	17.1	11.1	6.2	355.1
1.1	8.1	35.7	147.6	47.9	30.6	65.2	3.0	22.8	5.4	5.1	2.0	374.5

Basin Rainfall (inches)

Avg 1948 thru 1968

WY 1968

Deviation

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
3.6	3.7	3.5	2.5	3.0	4.0	4.2	5.3	3.5	3.9	3.3	3.5	44.0	
1.7	6.8	8.5	1.1	3.1	3.9	4.1	1.6	1.5	4.6	2.1	2.8	41.8	
-1.9	3.1	5.0	-1.4	.1	-.1	-.1	-3.7	-2.0	.7	-1.2	-.7	-2.2	

Pool Elevation

End of Month

Maximum

Minimum

384.10	385.20	406.48	385.98	384.44	387.36	387.64	387.08	379.00	377.10	373.24	370.73
384.58	385.40	406.96	406.48	388.09	387.72	393.64	387.64	387.08	379.00	377.10	373.24
384.04	384.06	384.22	385.98	384.22	384.22	387.26	387.08	379.00	376.66	373.24	370.33

Pool Content EOM

(1,000 AC. FT.)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
24.9	28.3	139.6	30.7	26.0	35.3	36.3	34.4	12.2	8.7	3.8	2.2	2.2	

ARKANSAS RIVER BASIN

ARTHUR V. OSBORN L & D

Releases (1,000 AC. FT.)

Avg 1970 thru 1988

WY 1988

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	2081.4	2767.7	3126.4	2204.1	2118.6	4039.2	4180.4	3755.0	3492.1	1635.9	768.7	823.8	30993.3
	680.6	1405.2	5917.7	6760.8	2334.0	5830.3	8483.3	1685.7	330.7	332.8	327.8	421.2	34510.1

Project Rainfall (inches)

Avg 1971 thru 1988

WY 1988

Deviation

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
4.0	5.1	4.7	2.3	2.9	4.3	3.9	4.8	4.2	2.6	2.9	3.6	45.3	
3.2	7.9	9.2	1.0	3.6	3.6	4.4	1.2	1.4	7.8	.7	2.8	46.8	
-.8	2.8	4.5	-1.3	.7	-.7	.5	-3.6	-2.8	5.2	-2.2	-.8	1.5	

Pool Elevation

End of Month

Maximum

Minimum

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
285.06	285.96	286.93	285.05	286.36	284.59	284.56	286.10	284.96	286.85	286.54	286.46	286.46	
286.34	286.85	292.56	286.93	286.99	286.52	287.21	286.89	287.58	287.37	287.18	287.73	287.73	
284.03	284.26	284.45	284.13	284.24	284.06	284.14	284.14	284.29	284.48	284.28	284.47	284.47	

Pool Content EOM

(1,000 AC. FT.)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
54.2	58.9	64.2	54.2	61.1	51.8	51.7	59.7	53.7	63.8	62.1	61.6	61.6	

LOAN SUCK FERRY L & D

Releases (1,000 AC. FT.)

Avg 1970 thru 1988

WY 1988

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
2006.9	2815.3	2942.6	2379.5	2260.9	4280.2	4373.7	3862.8	3563.3	2066.5	775.8	839.9	32167.4	
679.3	1462.1	5987.0	7165.0	2351.8	5816.4	8695.3	1637.4	337.3	395.4	389.2	445.3	35361.5	

Project Rainfall (inches)

Avg 1971 thru 1988

WY 1988

Deviation

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
4.1	5.5	4.9	2.5	3.2	4.5	4.4	4.9	4.4	2.4	2.7	3.4	46.9	
2.0	7.4	10.1	1.6	3.0	3.1	4.1	1.1	.9	4.3	2.0	2.0	41.6	
-2.1	1.9	5.2	-.9	-.2	-1.4	-.3	-3.8	-3.5	1.9	-.7	-1.4	-5.3	

Pool Elevation

End of Month

Maximum

Minimum

265.21	264.90	272.35	264.48	265.39	265.54	264.43	265.36	265.38	265.36	265.42	265.40
265.80	265.82	276.32	272.35	265.43	270.50	271.77	266.15	266.00	265.72	265.64	265.64
264.86	264.05	264.62	264.17	264.28	264.27	264.25	264.31	264.92	264.97	264.82	264.83

Pool Content EOM

(1,000 AC. FT.)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
33.9	32.6	90.0	30.9	34.7	35.3	30.7	34.5	34.6	34.5	34.8	34.8	34.7	

ARKANSAS RIVER BASIN

MURKIN LAKE

Releases (1,000 AC. FT.)

Avg 1944 thru 1988

WY 1988

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflow (1,000 AC. FT.)	19.0	40.3	72.3	64.9	85.8	102.4	89.8	93.2	36.6	12.4	5.9	6.8	629.4
	.1	63.7	244.5	76.7	41.2	63.1	85.1	4.8	.4	2.5	.8	.3	583.2

Releases (1,000 AC. FT.)

Avg 1944 thru 1988

WY 1988

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	9.6	30.6	67.2	67.9	76.1	95.3	94.5	93.8	50.5	23.6	10.5	9.0	628.6
	.5	43.9	65.8	207.9	104.0	49.0	72.7	14.8	.7	3.9	3.8	1.6	568.6

Basin Rainfall (inches)

Avg 1944 thru 1988

WY 1988

Deviation

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	3.8	4.0	4.0	3.0	3.5	4.9	4.7	5.8	4.1	4.0	3.2	3.7	48.7
	2.0	7.6	9.5	1.8	2.2	4.1	4.1	1.8	2.5	3.7	3.0	2.8	45.1
	-1.8	3.6	5.5	-1.2	-1.3	-8	-6	-4.0	-1.6	-3	-2	-9	-3.6

Pool Elevation

End of Month

Maximum

Minimum

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	341.57	346.20	366.13	353.49	342.27	345.45	347.56	345.25	344.77	344.07	342.95	342.33	
	342.11	347.59	366.13	366.41	353.49	347.01	352.23	347.56	345.43	344.81	344.07	343.01	
	341.57	341.51	342.03	353.49	341.93	342.25	345.45	345.07	344.77	344.07	342.95	342.15	

Pool Content EOM

(1,000 AC. FT.)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	27.5	46.9	225.3	93.1	30.0	43.2	54.1	42.3	40.0	37.1	32.4	30.2	

MURRAY LOCK AND DAM

Releases (1,000 AC. FT.)

Avg 1970 thru 1988

WY 1988

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	2121.5	2855.7	3224.0	2466.8	2371.4	4422.5	4578.4	4190.4	3654.3	1634.5	728.4	814.9	33062.8
	690.1	1606.0	6262.1	7190.9	2657.5	5780.2	8782.0	1719.6	308.5	306.2	299.2	385.1	35987.4

Project Rainfall (inches)

Avg 1971 thru 1988

WY 1988

Deviation

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	3.7	5.5	4.8	2.7	3.1	4.2	5.0	5.1	3.6	2.6	2.4	3.4	46.1
	1.5	11.0	14.3	2.4	3.5	3.8	4.1	1.2	1.3	6.7	.7	1.3	51.8
	-2.2	5.5	9.5	-.3	.4	-.4	-.9	-3.9	-2.3	4.1	-1.7	-2.1	5.7

Pool Elevation

End of Month

Maximum

Minimum

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	250.54	248.95	246.91	248.79	250.26	248.04	248.42	250.48	250.55	250.45	250.54	250.35	
	250.67	250.94	250.24	248.81	250.52	250.27	248.42	250.75	250.60	250.73	250.70	250.68	
	250.30	248.43	246.91	246.76	248.72	247.03	247.03	248.33	250.28	250.02	250.00	250.10	

Pool Content EOM

(1,000 AC. FT.)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	103.4	86.6	68.9	85.2	100.3	78.4	81.8	102.7	103.5	102.4	103.4	101.3	

ARKANSAS RIVER BASIN

DAVID D. TERRY L. & D. Releases (1,000 AC. FT.)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Avg 1969 thru 1988	2027.2	2744.0	3291.7	2632.9	2555.9	4477.8	4654.5	4234.0	3735.6	1747.0	771.7	821.3	33693.6
UY 1988	703.0	1628.2	6295.3	7276.3	2665.5	5852.1	8769.0	1697.4	331.7	321.9	280.7	374.8	36195.9
Project Rainfall (inches)													
Avg 1971 thru 1988	4.2	5.1	4.5	3.2	3.0	4.1	4.7	5.0	3.8	3.0	2.4	3.0	46.0
UY 1988	1.0	8.9	7.5	2.0	2.0	1.7	2.6	.5	.5	2.5	1.6	.9	31.7
Deviation	-3.2	3.8	3.0	-1.2	-1.0	-2.4	-2.1	-4.5	-3.3	-.5	-.8	-2.1	-14.3
Pool Elevation													
End of Month	231.46	230.82	232.31	231.31	231.27	229.96	230.53	231.34	231.11	230.85	231.02	231.12	
Maximum	231.83	231.69	236.18	232.31	231.62	231.64	231.11	233.12	231.55	231.76	231.59	231.84	
Minimum	230.97	230.48	230.39	229.22	230.36	229.96	229.38	230.53	230.81	230.65	230.45	230.65	
Pool Content EOM (1,000 AC. FT.)	51.6	48.8	55.8	50.9	50.7	45.5	47.7	51.1	50.0	48.9	49.6	50.1	

LOCK AND DAM NO. 5 Releases (1,000 AC. FT.)	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Avg 1970 thru 1988	2135.0	2890.7	3205.9	2556.3	2350.0	4452.0	4667.8	4182.8	3728.1	1709.1	772.3	860.6	33510.6
UY 1988	714.1	1649.0	6022.9	7227.9	2739.6	5787.8	8943.9	1749.9	336.1	382.1	333.7	448.1	36335.1
Project Rainfall (inches)													
Avg 1972 thru 1988	4.3	4.9	4.9	2.9	3.3	4.3	4.7	5.5	3.6	3.1	2.6	3.5	47.6
UY 1988	.3	6.1	5.7	.3	.6	1.7	1.6	1.0	1.5	3.3	1.3	.9	24.3
Deviation	-4.0	1.2	.8	-2.6	-2.7	-2.6	-3.1	-4.5	-2.1	.2	-1.3	-2.6	-23.3
Pool Elevation													
End of Month	213.01	212.80	212.48	212.90	213.06	211.96	212.02	213.58	213.86	213.79	213.71	213.89	
Maximum	213.75	213.25	215.52	212.90	213.24	213.15	212.66	213.88	213.99	213.98	213.89	214.02	
Minimum	212.81	211.82	211.29	211.01	211.92	211.00	210.97	212.02	213.39	213.40	213.44	213.54	
Pool Content EOM (1,000 AC. FT.)	61.4	60.0	58.0	60.7	61.7	54.7	55.0	65.5	67.5	67.0	66.4	67.7	

ARKANSAS RIVER BASIN

LOCK AND DAM NO. 4	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Releases (1,000 AC. FT.)													
Avg 1970 thru 1988	2147.6	2949.3	3266.5	2614.4	4098.2	4577.9	4878.5	4340.1	3863.4	1727.0	761.9	850.8	36075.6
WY 1988	725.7	1725.3	6096.9	7501.4	2963.6	5918.4	9141.8	1836.2	344.0	365.5	312.9	408.7	37340.4
Project Rainfall (inches)													
Avg 1972 thru 1988	4.2	5.2	5.4	3.4	3.5	4.4	4.3	5.4	3.4	3.5	2.7	3.8	49.2
WY 1988	1.4	12.6	9.7	1.9	1.6	2.5	2.4	.5	1.1	5.1	.5	1.8	41.1
Deviation	-2.8	7.4	4.3	-1.5	-1.9	-1.9	-1.9	-4.9	-2.3	1.6	-2.2	-2.0	-8.1
Pool Elevation													
End of Month	196.19	195.41	196.66	195.70	196.06	195.13	195.51	196.11	196.12	196.50	196.08	196.50	
Maximum	196.58	196.39	199.26	196.66	196.31	196.26	196.68	197.00	196.55	196.66	196.87	196.66	196.66
Minimum	195.93	195.41	194.83	194.13	195.25	194.02	194.21	195.51	195.86	195.54	195.78	195.79	195.79
Pool Content EOM (1,000 AC. FT.)	71.7	67.2	74.8	68.8	70.8	65.7	67.8	71.1	71.2	73.7	70.9	73.7	73.7

LOCK AND DAM NO. 3	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Releases (1,000 AC. FT.)													
Avg 1970 thru 1988	2163.5	2981.0	3321.9	2631.0	2540.0	4623.5	4979.5	4469.2	3916.0	1731.8	740.4	836.7	34934.5
WY 1988	725.2	1761.2	6176.8	7649.6	3055.9	5953.8	9262.4	1859.1	330.6	305.5	256.9	339.6	37676.6
Project Rainfall (inches)													
Avg 1971 thru 1988	4.0	5.1	4.8	3.6	3.3	4.3	4.2	5.0	3.5	3.1	3.0	3.4	47.3
WY 1988	.6	12.9	8.3	4.2	1.9	2.8	3.2	.9	.6	4.6	1.2	2.3	43.5
Deviation	-3.4	7.8	3.5	.6	-1.4	-1.5	-1.0	-4.1	-2.9	1.5	-1.8	-1.1	-3.8
Pool Elevation													
End of Month	182.02	181.49	184.99	182.06	181.99	181.05	181.92	181.89	181.97	182.12	181.88	182.30	
Maximum	182.51	182.58	187.51	184.99	182.40	182.45	184.34	182.97	182.47	182.53	182.35	182.41	182.41
Minimum	181.85	181.47	181.22	180.49	181.21	180.64	180.65	181.49	181.72	181.71	181.74	181.75	181.75
Pool Content EOM (1,000 AC. FT.)	46.5	44.4	59.8	46.6	46.4	42.7	46.1	46.0	46.3	46.9	45.9	47.6	47.6

ARKANSAS RIVER BASIN

VILLBUR D. MILLS DAM	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Releases (1,000 AC. FT.)													
Avg 1970 thru 1988	2059.2	3022.8	3526.7	2701.2	2617.4	4763.9	5123.1	4160.0	3918.7	1733.2	752.4	1359.9	35738.5
WY 1988	725.4	1826.7	6306.3	7775.7	3137.1	5864.8	9305.0	1816.1	293.7	316.9	249.6	342.4	37957.7
Project Rainfall (inches)													
Avg 1971 thru 1988	4.5	5.8	5.4	4.3	4.2	6.0	4.7	5.0	3.7	3.2	3.0	3.7	53.5
WY 1988	.6	7.7	5.8	2.9	2.2	3.7	2.9	.4	.5	5.2	1.1	2.8	35.8
Deviation	-3.9	1.9	.4	-1.4	-2.0	-2.3	-1.8	-4.6	-3.2	2.0	-1.9	-.9	-17.7
Pool Elevation													
End of Month	162.18	161.59	160.70	161.62	163.19	161.14	161.66	163.14	162.10	162.10	161.90	162.50	
Maximum	162.48	162.57	162.36	161.67	163.19	163.19	161.66	163.44	163.45	162.61	162.62	162.65	
Minimum	161.97	161.36	160.70	160.30	161.31	160.95	160.48	161.56	162.04	161.74	161.71	161.83	
Pool Content EOM													
(1,000 AC. FT.)	112.1	105.7	96.6	106.0	123.5	100.9	106.5	122.9	111.2	111.2	109.0	115.7	

HORREL LOCK NO. 1 _____ (No basic data collected)

RED RIVER BASIN

ALTUS LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AUG 1938 THRU 1981	7.13	2.75	3.44	3.77	5.05	5.93	9.57	29.65	20.95	8.39	3.01	3.01	102.7
FY 1988	3.23	3.17	10.01	15.00	9.62	25.19	20.78	9.52	7.67	2.59	0.04	25.93	132.7
RELEASES(1000AC.FT.)													
AUG 1976 THRU 1988	0.22	3.19	1.46	1.84	2.80	5.72	2.60	17.10	6.25	7.72	5.25	0.38	54.5
FY 1988	0.00	0.00	0.00	4.36	8.88	24.59	16.30	8.46	0.35	0.00	0.00	0.00	62.9
RAINFALL(INCHES)													
AUG 1930 THRU 1980	1.99	0.88	0.77	0.63	0.83	1.19	1.99	4.09	3.19	2.21	2.50	2.30	22.57
FY 1988	0.79	0.14	0.43	0.19	0.03	1.16	1.81	0.33	1.59	1.26	1.01	4.58	13.32
DEVIATION	-1.20	-0.74	-0.34	-0.44	-0.80	-0.03	-0.18	-3.76	-1.60	-0.95	-1.49	2.28	-9.25
POOL ELEVATION													
END OF MONTH	1555.66	1556.02	1557.56	1559.19	1559.32	1559.18	1559.43	1558.93	1556.70	1552.90	1544.57	1550.02	
MAXIMUM	1555.66	1556.03	1557.56	1559.19	1559.34	1559.91	1559.48	1559.43	1559.12	1556.77	1552.90	1550.02	
MINIMUM	1555.29	1555.66	1556.02	1557.56	1558.98	1558.94	1558.94	1558.86	1556.59	1552.90	1544.57	1544.38	
POOL CONTENT-EDM (1000AC.FT)	112.96	114.99	124.03	134.04	134.86	133.98	135.56	132.40	118.93	98.03	61.10	83.94	

RED RIVER BASIN

MOUNTAIN PARK DAM	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AUG 1926 THRU 1981	1.51	0.45	0.36	0.25	0.33	0.66	1.38	5.73	4.07	1.28	0.73	1.77	18.5
FY 1988	0.31	0.06	2.27	7.89	0.80	17.29	5.21	0.97	0.96	0.00	0.52	16.15	52.5
RELEASES(1000AC.FT.)													
AUG 1981 THRU 1988	1.14	2.68	0.70	0.00	1.37	1.88	0.26	3.08	2.95	0.55	0.00	0.00	14.6
FY 1988	0.00	0.00	0.00	0.00	0.00	10.29	1.85	0.00	0.00	0.00	0.00	0.00	12.1
RAINFALL(INCHES)													
AUG 1930 THRU 1980	2.49	1.35	1.14	1.03	1.18	1.55	2.43	4.82	3.37	2.15	2.26	2.87	26.64
FY 1988	2.14	0.33	3.03	0.77	0.02	1.85	4.16	0.97	2.04	1.59	1.70	8.43	27.03
DEVIATION	-0.35	-1.02	1.89	-0.26	-1.16	0.30	1.73	-3.83	-1.33	-0.56	-0.56	5.56	0.39
POOL ELEVATION													
END OF MONTH	1409.60	1409.23	1409.33	1410.40	1410.25	1410.88	1410.91	1410.41	1409.86	1409.03	1408.21	1410.39	
MAXIMUM	1409.99	1409.60	1409.37	1410.42	1410.42	1412.50	1411.20	1410.91	1410.42	1409.88	1409.03	1410.52	
MINIMUM	1409.45	1409.23	1409.07	1409.32	1410.25	1410.25	1410.86	1410.40	1409.83	1409.03	1408.21	1408.14	
POOL CONTENT-EOM (1000AC.FT)	80.34	78.15	78.74	85.21	84.27	88.22	88.41	85.27	81.87	76.97	72.30	85.14	

RED RIVER BASIN

LAKE KEMP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AUG 1924 THRU 1981	22.20	5.94	6.74	3.73	5.59	7.68	12.78	38.02	25.28	15.57	18.91	27.01	189.4
FY 1988	0.56	0.05	6.29	5.31	2.25	6.85	5.17	1.51	5.38	11.50	0.00	33.49	78.4
RELEASES(1000AC.FT.)													
AUG 1976 THRU 1988	7.86	8.21	2.23	1.94	1.67	5.29	3.94	5.06	13.73	15.56	13.41	9.55	88.4
FY 1988	7.73	4.12	0.09	0.00	0.00	0.00	4.19	10.81	12.65	12.89	21.06	4.89	78.4
RAINFALL(INCHES)													
AUG 1930 THRU 1980	2.41	1.08	0.98	0.83	1.00	1.10	1.88	3.66	2.73	1.99	2.22	2.92	22.80
FY 1988	1.06	0.04	0.50	0.16	0.05	0.34	1.15	0.16	2.13	1.76	0.25	3.08	10.68
DEVIATION	-1.35	-1.04	-0.48	-0.67	-0.95	-0.76	-0.73	-3.50	-0.60	-0.23	-1.97	0.16	-12.17
POOL ELEVATION													
END OF MONTH	1141.80	1141.20	1141.47	1141.76	1141.77	1141.90	1141.46	1140.07	1138.84	1137.87	1134.75	1137.29	
MAXIMUM	1142.75	1141.84	1141.56	1141.82	1141.84	1142.15	1141.98	1141.46	1140.11	1139.04	1137.87	1137.34	
MINIMUM	1141.80	1141.20	1141.14	1141.43	1141.70	1141.76	1141.46	1140.03	1138.75	1137.87	1134.75	1134.06	
POOL CONTENT-EOM (1000AC.FT)	235.40	227.00	230.78	234.84	234.98	236.80	230.64	211.83	196.44	185.31	155.13	179.10	

RED RIVER BASIN

MAURIKA LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AUG 1925 THRU 1981	7.81	4.14	3.26	1.71	3.76	5.22	7.51	26.25	17.73	3.32	1.70	4.28	86.7
FY 1988	3.57	4.62	30.77	18.19	4.99	51.42	36.76	4.48	7.71	1.80	0.08	14.58	179.0
RELEASES(1000AC.FT.)													
AUG 1983 THRU 1988	17.38	24.38	8.72	16.11	8.65	32.27	17.98	13.24	33.99	7.16	0.17	2.02	182.1
FY 1988	0.16	0.00	15.13	24.98	2.76	23.32	54.55	0.52	0.31	0.25	0.25	0.24	122.5
RAINFALL(INCHES)													
AUG 1930 THRU 1980	2.92	1.79	1.47	1.30	1.47	1.94	2.75	5.21	3.61	2.31	2.36	3.26	30.39
FY 1988	3.61	0.90	1.63	1.22	0.09	2.80	2.71	0.05	1.14	1.23	0.56	5.32	21.26
DEVIATION	0.69	-0.89	0.16	-0.08	-1.38	0.86	-0.04	-5.16	-2.47	-1.08	-1.80	2.06	-9.13
POOL ELEVATION													
END OF MONTH	950.91	951.09	952.36	951.55	951.61	953.78	951.54	951.28	951.34	950.80	949.99	950.91	
MAXIMUM	951.07	951.10	952.91	952.63	951.83	953.78	955.25	951.69	951.63	951.43	951.65	951.07	
MINIMUM	950.50	950.75	951.09	951.43	951.40	951.40	951.42	951.27	951.23	950.77	949.96	949.92	
POOL CONTENT-EDM (1000AC.FT)	197.96	199.83	213.30	204.62	205.24	229.14	204.52	201.81	202.44	196.82	188.40	197.96	

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RED RIVER BASIN

FOSS RESERVOIR

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AUG 1926 THRU 1980	3.53	1.79	1.23	1.31	1.79	2.86	9.34	15.36	12.37	3.69	3.11	2.87	59.3
FY 1988	2.20	2.13	8.82	5.59	1.55	10.97	11.83	7.14	5.44	2.84	0.33	5.07	63.9
RELEASES(1000AC.FT.)													
AUG 1978 THRU 1988	1.38	0.96	0.52	1.92	1.68	2.27	2.52	3.85	8.23	3.26	1.51	0.44	28.5
FY 1988	0.61	0.59	1.13	9.48	11.28	10.21	6.54	6.76	2.25	0.61	0.61	0.59	50.7
RAINFALL(INCHES)													
AUG 1930 THRU 1980	1.92	1.06	0.74	0.64	0.88	1.30	2.25	4.23	3.11	1.98	2.44	2.25	22.80
FY 1988	0.26	0.13	0.29	0.16	0.02	1.53	1.93	0.23	2.58	2.72	1.24	4.61	15.70
DEVIATION	-1.66	-0.93	-0.45	-0.48	-0.86	0.23	-0.32	-4.00	-0.53	0.74	-1.20	2.36	-7.10
POOL ELEVATION													
END OF MONTH	1642.20	1642.20	1643.13	1642.41	1640.72	1641.06	1641.35	1640.80	1640.59	1640.27	1639.62	1639.97	
MAXIMUM	1642.30	1642.20	1643.18	1643.15	1642.41	1641.16	1641.35	1641.40	1640.88	1640.66	1640.27	1640.16	
MINIMUM	1642.15	1642.20	1642.20	1642.41	1640.72	1640.33	1640.98	1640.75	1640.48	1640.27	1639.62	1639.48	
POOL CONTENT-EDM (1000AC.FT)	179.28	179.28	185.72	180.73	169.40	171.62	173.56	169.92	168.56	166.49	162.34	164.55	

RED RIVER BASIN

FORT COBB RESERVOIR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AUG 1926 THRU 1981	2.94	1.88	2.05	2.27	2.38	3.09	4.10	6.26	5.89	2.86	1.85	2.41	38.0
FY 1988	2.34	2.52	4.09	6.74	3.34	10.67	13.97	2.04	2.97	1.60	1.41	6.65	58.3
RELEASES(1000AC.FT.)													
AUG 1976 THRU 1988	1.79	2.56	0.28	0.83	0.66	1.25	0.44	0.64	7.29	0.86	0.14	0.20	16.9
FY 1988	0.00	0.00	3.54	4.30	0.85	8.66	5.78	6.31	0.00	0.00	0.00	0.00	29.4
RAINFALL(INCHES)													
AUG 1930 THRU 1980	2.37	1.39	1.18	1.00	1.12	1.62	2.64	4.78	3.67	2.28	2.47	3.07	27.59
FY 1988	1.66	0.99	1.69	0.60	0.09	3.63	5.49	0.55	2.58	2.41	2.39	6.29	28.37
DEVIATION	-0.71	-0.40	0.51	-0.40	-1.03	2.01	2.85	-4.23	-1.09	0.13	-0.08	3.22	0.78
POOL ELEVATION													
END OF MONTH	1341.99	1342.17	1342.00	1342.17	1342.38	1342.20	1343.57	1341.81	1341.62	1341.08	1340.47	1341.43	
MAXIMUM	1341.99	1342.17	1342.57	1342.53	1342.38	1343.48	1343.58	1343.58	1341.83	1341.69	1341.15	1341.52	
MINIMUM	1341.69	1341.91	1342.00	1342.00	1342.17	1341.97	1341.97	1341.76	1341.55	1341.08	1340.47	1340.00	
POOL CONTENT-EOM (1000AC.FT)	79.97	80.72	80.01	80.72	81.59	80.84	86.62	79.24	78.48	76.30	73.91	77.71	

RED RIVER BASIN

ARBUCKLE RESERVOIR	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AUG 1926 THRU 1981	3.80	3.24	3.29	3.07	4.90	5.63	8.07	12.49	7.59	2.94	2.12	3.74	60.9
FY 1988	1.58	3.26	24.51	11.12	4.04	18.49	6.69	1.69	1.44	0.58	0.38	0.75	74.5
RELEASES(1000AC.FT.)													
AUG 1976 THRU 1988	1.42	0.69	3.38	3.02	2.82	5.05	5.01	8.98	9.00	0.39	0.22	0.23	40.2
FY 1988	0.19	1.17	22.64	13.92	4.21	17.83	5.33	0.06	0.06	0.06	0.06	0.06	65.6
RAINFALL(INCHES)													
AUG 1930 THRU 1980	3.48	2.33	2.06	1.75	2.21	2.92	3.86	5.65	3.90	2.48	2.78	3.75	37.17
FY 1988	2.64	2.56	3.94	1.00	0.77	3.03	1.27	0.64	2.24	2.01	0.46	4.20	24.76
DEVIATION	-0.84	0.23	1.88	-0.75	-1.44	0.11	-2.59	-5.01	-1.66	-0.47	-2.32	0.45	-12.41
POOL ELEVATION													
END OF MONTH	872.24	872.99	873.68	872.39	872.26	872.21	872.03	871.85	871.58	870.87	869.99	869.52	
MAXIMUM	872.26	873.06	876.58	873.68	872.41	875.19	872.85	872.11	871.92	871.58	870.87	870.07	
MINIMUM	871.70	871.98	872.01	871.95	871.99	872.00	871.99	871.84	871.48	870.87	869.99	869.52	
POOL CONTENT-EOM (1000AC.FT)	72.97	74.76	76.43	73.33	73.02	72.90	72.47	72.05	71.42	69.78	67.78	66.73	

RED RIVER BASIN

LAKE TEXOMA	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1906 THRU 1981	366.34	199.55	180.83	140.89	166.47	227.04	413.04	812.92	688.44	214.49	177.99	240.90	3828.9
FY 1988	140.03	198.74	858.84	504.10	221.26	813.26	680.73	176.73	145.19	104.93	26.18	315.17	4185.2
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1988	360.68	297.11	185.49	248.88	180.54	349.73	280.41	365.59	886.11	352.65	145.89	109.53	3762.6
FY 1988	207.25	175.97	288.56	799.44	395.40	626.06	694.41	263.06	120.43	120.30	106.27	23.19	3820.3
RAINFALL(INCHES)													
AVG 1930 THRU 1980	2.49	1.39	1.22	1.13	1.28	1.64	2.48	4.39	3.30	2.20	2.33	2.89	26.74
FY 1988	1.56	0.48	1.14	0.43	0.06	1.55	2.10	0.38	2.47	1.40	0.79	4.53	16.89
DEVIATION	-0.93	-0.91	-0.08	-0.70	-1.22	-0.09	-0.38	-4.01	-0.83	-0.80	-1.54	1.64	-9.85
POOL ELEVATION													
END OF MONTH	614.44	614.52	620.81	617.52	615.31	617.19	616.55	615.00	614.69	613.87	612.22	615.61	
MAXIMUM	615.45	614.56	620.81	620.81	617.52	617.86	618.47	616.55	615.25	614.69	613.87	615.61	
MINIMUM	614.39	614.02	614.14	617.52	615.31	615.27	616.55	615.00	614.68	613.87	612.22	612.03	
POOL CONTENT-EOM (1000AC.FT)	2433.12	2439.36	2999.03	2690.10	2501.60	2660.40	2604.37	2476.80	2452.62	2388.89	2264.64	2525.60	

VII-35

RED RIVER BASIN

MCREE CREEK	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1938 THRU 1976	5.37	6.61	5.69	4.84	10.14	11.89	18.50	17.98	10.32	4.03	1.97	4.72	102.1
FY 1988	1.29	13.65	60.77	9.84	9.67	21.46	4.74	0.02	0.07	0.50	0.33	0.26	122.6
RELEASES(1000AC.FT.)													
LAKE HAS NOT FILLED													
RAINFALL(INCHES)													
AVG 1930 THRU 1980	0.00	1.72	1.18	2.17	3.05	3.38	5.02	6.08	4.44	3.45	2.99	3.40	36.88
FY 1988	4.03	4.93	5.38	0.58	2.12	3.05	1.91	0.70	1.00	3.47	3.85	1.14	32.16
DEVIATION	4.03	3.21	4.20	-1.59	-0.93	-0.33	-3.11	-5.38	-3.44	0.02	0.86	-2.26	-4.72
POOL ELEVATION (1)													
END OF MONTH	165.40	167.86	174.80	175.54	175.91	175.89	175.89	175.72	175.55	175.40	175.26	175.12	
MAXIMUM	165.40	167.86	174.80	175.54	176.03	176.52	176.00	175.90	175.73	175.55	175.40	175.26	
MINIMUM	165.11	165.36	167.86	174.80	175.54	175.84	175.89	175.72	175.55	175.40	175.26	175.12	
POOL CONTENT-EOM (1000AC.FT)	28.09	40.94	100.79	109.58	114.07	113.83	113.83	111.77	109.70	107.89	106.19	104.49	

(1) ELEVATIONS ARE IN METERS

RED RIVER BASIN

PAT MAYSE LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLWS(1000AC.FT.)													
AUG 1937 THRU 1981	4.89	7.23	7.99	6.38	11.78	12.30	16.04	15.77	10.14	3.64	1.49	4.15	101.8
FY 1988	2.18	18.89	34.24	7.81	14.16	12.09	9.58	1.77	0.48	1.42	0.98	0.03	103.6
RELEASES(1000AC.FT.)													
AUG 1976 THRU 1988	0.28	2.94	6.28	4.23	7.16	12.93	9.38	9.78	11.79	4.78	0.52	0.00	70.1
FY 1988	0.00	4.77	19.04	20.65	10.09	8.02	11.59	2.67	0.08	0.00	0.00	0.00	76.9
RAINFALL(INCHES)													
AUG 1930 THRU 1980	3.55	3.39	3.21	2.76	3.09	3.74	4.71	5.30	4.01	3.28	2.62	4.19	43.85
FY 1988	2.73	3.86	3.09	0.57	1.94	2.45	1.73	0.92	0.79	3.48	1.87	1.07	24.50
DEVIATION	-0.82	0.47	-0.12	-2.19	-1.15	-1.29	-2.98	-4.38	-3.22	0.20	-0.75	-3.12	-19.35
POOL ELEVATION													
END OF MONTH	450.15	452.22	454.36	452.05	452.41	452.66	451.89	451.09	450.55	450.12	449.60	449.01	
MAXIMUM	450.17	452.40	455.05	454.36	453.19	452.66	453.00	451.89	451.09	450.55	450.12	449.60	
MINIMUM	449.76	450.08	451.95	452.05	451.60	451.69	451.89	451.09	450.55	450.12	449.60	449.01	
POOL CONTENT-EOM (1000AC.FT)	119.48	131.96	145.57	130.91	133.14	134.69	129.93	125.05	121.84	119.31	116.28	112.86	

VII-36

RED RIVER BASIN

SARDIS LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLWS(1000AC.FT.)													
AUG 1926 THRU 1981	9.07	15.39	20.38	21.79	26.99	30.93	39.85	39.52	19.88	6.87	2.66	9.87	245.9
FY 1988	0.75	38.22	92.33	17.31	15.86	37.75	20.65	2.92	2.86	7.38	4.36	1.43	241.8
RELEASES(1000AC.FT.)													
AUG 1985 THRU 1988	10.48	53.52	39.99	28.21	14.98	37.59	29.69	27.68	30.40	0.00	0.00	0.00	272.6
FY 1988	0.00	27.53	38.66	68.70	13.41	29.49	21.90	0.00	0.00	0.00	0.00	0.00	199.7
RAINFALL(INCHES)													
AUG 1930 THRU 1980	3.44	3.40	2.78	2.50	3.01	3.63	4.78	6.03	4.34	3.54	3.28	4.57	45.30
FY 1988	1.92	5.39	4.82	0.65	1.01	2.52	2.35	0.84	1.17	3.26	2.98	1.60	28.51
DEVIATION	-1.52	1.99	2.04	-1.85	-2.00	-1.11	-2.43	-5.19	-3.17	-0.28	-0.30	-2.97	-16.79
POOL ELEVATION													
END OF MONTH	598.52	599.15	602.73	599.04	599.08	599.40	599.00	598.72	598.37	598.34	598.20	597.95	
MAXIMUM	598.74	600.06	603.46	602.73	599.38	599.76	599.72	599.00	598.72	598.48	598.34	598.20	
MINIMUM	598.39	598.49	598.94	598.96	598.97	598.95	598.95	598.72	598.37	598.21	598.18	597.95	
POOL CONTENT-EOM (1000AC.FT)	267.90	276.41	328.25	275.16	275.44	279.88	274.33	270.58	265.90	265.49	263.62	260.30	

RED RIVER BASIN

HUGO LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1926 THRU 1964	40.79	74.01	117.34	160.37	177.57	171.23	257.85	250.16	114.02	56.90	19.14	49.05	1485.4
FY 1988	15.95	200.83	451.08	180.40	121.39	198.00	196.36	10.71	9.52	39.77	33.72	9.74	1467.5
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1988	54.72	114.88	132.54	112.86	150.30	214.23	212.94	208.25	149.36	43.02	20.17	15.13	1428.4
FY 1988	8.69	141.33	220.53	457.80	119.92	180.14	204.69	12.11	16.11	19.46	19.81	13.09	1413.7
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.65	3.75	3.19	2.85	3.27	3.92	5.03	6.09	4.24	3.54	3.31	4.55	47.34
FY 1988	2.42	3.58	3.27	0.43	0.91	2.31	1.59	0.49	1.68	2.61	1.88	1.63	22.80
DEVIATION	-1.23	-0.17	0.08	-2.42	-2.36	-1.61	-3.44	-5.60	-2.56	-0.93	-1.43	-2.92	-24.59
POOL ELEVATION													
END OF MONTH	404.07	408.10	419.63	404.60	404.52	405.56	404.63	404.12	403.10	404.18	404.81	404.20	
MAXIMUM	404.07	409.90	420.15	419.63	408.07	405.90	408.12	404.63	404.20	404.48	405.16	404.90	
MINIMUM	403.32	404.03	406.40	404.60	404.50	404.40	404.43	404.10	403.10	402.52	403.66	403.87	
POOL CONTENT-EDM (1000AC.FT)	151.74	209.21	438.26	158.90	157.82	171.91	159.30	152.42	139.64	153.23	161.73	153.50	

VII-37

RED RIVER BASIN

PINE CREEK LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1929 THRU 1981	22.63	38.04	56.04	60.24	78.03	82.93	95.41	104.78	42.28	17.51	8.38	22.66	628.7
FY 1988	17.45	129.58	213.22	63.77	63.13	84.40	130.81	2.26	0.18	13.98	31.08	0.57	750.4
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1988	24.53	54.94	66.93	53.99	66.05	86.90	81.93	86.03	64.11	14.04	9.19	9.39	618.0
FY 1988	14.93	98.27	99.10	209.70	62.70	47.38	146.27	4.24	4.00	4.16	37.81	3.91	732.5
RAINFALL(INCHES)													
AVG 1930 THRU 1980	3.76	3.89	3.59	3.12	3.48	4.25	5.15	6.21	4.28	3.87	3.53	4.67	49.80
FY 1988	2.98	4.28	3.04	0.39	1.46	2.71	1.44	0.61	0.82	2.22	2.42	1.22	23.54
DEVIATION	-0.78	0.39	-0.55	-2.73	-2.02	-1.54	-3.71	-5.60	-3.46	-1.65	-1.11	-3.45	-26.21
POOL ELEVATION													
END OF MONTH	438.86	445.29	460.35	438.10	438.06	445.85	442.54	441.72	440.25	442.02	440.11	438.79	
MAXIMUM	440.00	451.39	460.44	460.35	443.54	445.85	453.81	442.60	441.72	442.03	445.35	440.15	
MINIMUM	437.17	437.75	438.15	438.02	437.90	437.94	442.38	441.72	440.25	439.75	440.11	438.79	
POOL CONTENT-EDM (1000AC.FT)	57.07	87.03	200.73	54.13	53.98	90.10	73.05	69.22	62.75	70.58	62.15	56.80	

RED RIVER BASIN

BROKEN BOW LAKE	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
INFLOWS(1000AC.FT.)													
AVG 1930 THRU 1981	34.81	58.40	95.11	111.71	114.40	140.87	130.36	138.16	52.17	26.71	14.15	23.55	940.4
FY 1988	14.16	145.86	315.11	70.04	73.78	101.21	118.31	7.34	4.31	14.58	28.42	4.70	897.8
RELEASES(1000AC.FT.)													
AVG 1976 THRU 1988	26.91	53.26	94.42	79.00	72.22	99.67	115.65	94.57	84.02	48.04	34.09	22.40	824.2
FY 1988	9.23	29.86	103.16	286.61	81.17	85.84	142.27	19.02	10.46	7.31	17.95	14.45	807.3
RAINFALL(INCHES)													
AVG 1930 THRU 1980	4.14	4.08	4.15	3.72	3.83	4.89	5.28	6.29	4.31	4.23	3.69	4.60	53.21
FY 1988	5.09	5.37	5.55	0.43	1.84	3.22	1.69	1.75	2.13	4.96	4.69	1.54	38.26
DEVIATION	0.95	1.29	1.40	-3.29	-1.99	-1.67	-3.59	-4.54	-2.18	0.73	1.00	-3.06	-14.95
POOL ELEVATION													
END OF MONTH	592.50	600.76	614.51	600.23	599.56	600.38	598.37	597.10	596.00	596.24	596.56	594.91	
MAXIMUM	592.51	601.17	614.94	614.51	600.67	600.38	603.48	598.41	597.10	596.72	597.06	596.56	
MINIMUM	591.62	592.41	599.44	600.09	599.09	598.20	598.32	597.10	596.00	595.97	595.81	594.84	
POOL CONTENT-EDM (1000AC.FT)	822.07	936.06	1146.68	928.47	918.94	930.62	902.15	884.42	872.01	872.56	876.97	854.37	

(1,000 AC. FT.)

01.22
02.88
01.22

RED RIVER BASIN

DIERS LAKE

Inflows (1,000 AC. FT.)

Avg 1930 thru 1988

WY 1988

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	4.7	9.9	16.9	18.7	17.6	22.0	19.4	20.5	7.1	4.2	1.1	3.1	145.2
	1.5	27.4	46.9	17.6	13.5	20.3	12.3	2.0	.1	1.9	.8	1.5	145.8

Releases (1,000 AC. FT.)

Avg 1977 thru 1988

WY 1988

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	4.7	8.1	16.6	16.1	12.7	18.3	18.6	15.8	9.6	6.5	2.0	.8	129.8
	.4	3.0	28.9	46.4	14.3	18.7	13.2	1.8	1.1	1.1	.9	.7	130.5

Basin Rainfall (inches)

Avg 1930 thru 1988

WY 1988

Deviation

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	4.7	4.7	4.6	3.9	4.1	5.1	5.3	6.1	4.8	4.1	3.2	3.9	54.5
	3.7	10.9	10.2	2.0	3.3	6.3	3.4	1.3	1.1	6.6	5.8	1.5	56.1
	-1.0	6.2	5.6	-1.9	-.8	1.2	-1.9	-4.8	-3.7	2.5	2.6	-2.4	1.6

Pool Elevation

End of Month

Maximum

Minimum

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	515.50	533.93	543.09	526.85	526.12	527.08	526.19	526.04	524.92	525.09	524.69	524.98	524.98
	515.50	533.99	543.51	543.09	528.66	529.69	529.55	526.30	526.04	525.52	525.09	525.58	525.58
	513.94	515.50	528.56	526.85	526.07	525.99	526.03	526.04	524.92	524.73	524.54	524.64	524.64

Pool Content EOM

(1,000 AC. FT.)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	17.6	41.9	59.8	30.8	29.8	31.1	29.9	29.7	28.2	28.4	27.9	28.3	28.3

MILLWOOD LAKE

Inflows (1,000 AC. FT.)

Avg 1929 thru 1988

WY 1988

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	119.8	259.5	409.6	437.9	489.8	578.9	602.0	644.5	287.0	124.9	70.3	96.1	4120.3
	54.6	521.2	1155.0	934.4	436.9	488.0	575.9	43.4	21.7	56.0	105.1	30.2	4422.4

Releases (1,000 AC. FT.)

Avg 1976 thru 1988

WY 1988

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	120.6	263.9	461.7	371.0	369.0	529.1	508.3	453.4	337.8	169.8	63.1	85.9	3753.6
	38.9	458.1	369.2	1387.9	442.8	473.5	266.9	32.4	16.4	24.3	90.1	120.5	3721.0

Intervening Basin Rainfall (inches)

Avg 1930 thru 1988

WY 1988

Deviation

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	3.9	4.4	4.0	3.4	3.8	4.4	4.8	5.7	3.9	3.5	2.9	.6	48.5
	4.1	9.1	9.8	1.7	3.1	5.1	3.2	1.2	1.6	6.0	5.7	1.6	52.2
	.2	4.7	5.8	-1.7	-.7	.7	-1.6	-4.5	-2.3	2.5	2.8	-2.2	3.7

Pool Elevation

End of Month

Maximum

Minimum

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	256.95	259.19	269.73	257.94	257.60	257.98	259.32	259.34	259.13	259.00	259.17	255.31	255.31
	256.95	260.26	270.30	269.73	258.91	258.52	261.20	259.46	259.40	259.61	259.84	259.17	259.17
	256.17	256.36	258.20	257.94	256.01	256.75	257.98	259.17	259.12	258.99	258.95	255.21	255.21

Pool Content EOM

(1,000 AC. FT.)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	144.7	204.8	625.6	169.9	161.2	170.9	208.7	209.3	203.1	199.2	204.2	107.9	107.9

RED RIVER BASIN

WRIGHT PATMAN LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 AC. FT.)													
Avg 1957 thru 1988	71.8	169.6	275.5	159.5	229.6	292.0	275.6	377.6	174.8	52.0	19.9	22.1	2124.1
WY 1988	24.9	529.0	963.4	291.4	1003.9	154.7	162.2	0.0	0.0	62.6	9.1	2.9	2471.9
Releases (1000 AC. FT.)													
Avg 1957 thru 1988	96.0	156.3	221.2	221.5	216.1	252.0	210.2	237.1	221.1	210.1	43.4	40.1	2175.2
WY 1988	12.9	260.7	535.0	607.0	576.7	268.8	124.4	4.1	0.6	0.5	0.6	0.5	2347.0
Rainfall (inches)													
Avg 1958 thru 1988	3.74	3.48	3.23	1.93	2.91	3.39	4.03	3.57	3.52	2.69	2.52	3.27	22.77
WY 1988	3.31	6.29	10.59	0.53	3.31	3.76	1.93	0.30	0.54	3.59	4.54	1.53	41.85
Deviation	-0.10	2.81	7.10	-1.40	0.40	0.37	-2.10	-3.59	-2.95	0.90	2.02	-1.84	1.52
Pool Elevation													
End of Month	224.59	231.97	240.12	236.08	237.50	233.13	224.29	223.27	222.51	224.18	223.63	223.15	
Maximum	224.71	242.03	240.12	241.85	236.08	237.36	229.07	224.29	223.27	224.25	224.18	223.63	
Minimum	224.29	224.44	230.25	236.08	227.36	222.68	223.13	223.27	222.51	222.25	223.63	223.15	
Pool Content EOM													
(1000 AC. FT.)	255.53	517.17	936.57	710.31	342.29	217.15	248.19	220.77	201.60	245.14	235.52	222.95	

LAKE O THE PINES

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 AC. FT.)													
Avg 1958 thru 1988	12.0	27.7	57.9	49.9	70.9	90.2	75.3	64.2	32.0	10.7	4.6	11.2	504.5
WY 1988	6.6	56.3	289.5	59.0	84.3	79.8	44.0	5.4	3.6	4.6	0.0	0.1	623.1
Releases (1000 AC. FT.)													
Avg 1958 thru 1988	9.5	14.5	47.5	54.8	61.8	75.0	63.9	54.5	34.5	13.7	9.9	11.7	452.7
WY 1988	2.5	26.3	81.8	125.5	137.5	168.5	46.1	2.4	2.0	1.5	1.5	1.5	598.2
Rainfall (inches)													
Avg 1980 thru 1988	5.14	5.16	5.54	2.03	4.35	3.04	3.05	4.36	4.50	1.73	1.66	2.09	42.56
WY 1988	3.18	8.32	12.89	0.36	3.82	4.72	1.49	0.73	0.91	2.48	1.29	1.39	41.89
Deviation	-1.95	3.15	7.35	-1.67	-0.53	1.68	-1.56	-3.63	-3.59	0.75	-0.37	-0.70	-1.03
Pool Elevation													
End of Month	228.77	230.12	238.84	236.20	233.74	229.26	228.84	228.54	228.09	227.69	227.05	226.56	
Maximum	229.98	230.31	238.84	238.92	236.20	233.74	229.35	228.91	228.54	228.10	227.69	227.06	
Minimum	228.59	228.71	229.66	236.20	233.74	229.26	228.52	228.54	228.09	227.69	227.05	226.50	
Pool Content EOM													
(1000 AC. FT.)	259.72	296.06	491.43	422.13	363.17	269.25	261.24	255.60	247.25	239.95	229.53	219.98	

NECHES RIVER BASIN

SAM RAYBURN RESERVOIR

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC. FT)													
Avg 1908 thru 1988	42.8	96.5	187.6	251.2	264.0	282.6	274.1	302.7	138.0	56.6	34.2	32.6	1962.0
WY 1988	4.0	241.3	376.5	324.6	151.9	292.2	156.1	22.2	14.3	37.2	35.1	2.3	1657.7
Releases(1000 AC. FT)													
Avg 1966 thru 1988	70.2	48.8	57.1	112.1	128.5	193.4	158.1	184.9	192.3	159.6	144.1	101.0	1550.1
WY 1988	161.0	79.0	7.8	133.6	97.8	252.6	103.0	127.7	170.3	163.7	170.6	158.1	1699.1
Rainfall (inches)													
Avg 1970 thru 1988	5.23	5.96	5.55	4.55	4.53	4.98	4.05	6.07	5.44	4.82	3.81	3.89	53.88
WY 1988	1.85	14.42	9.83	3.70	2.01	7.05	3.01	0.63	1.03	8.87	1.63	2.15	55.18
Deviation	-3.33	8.46	4.28	-0.85	-2.52	2.07	-1.04	-5.44	-4.41	4.05	-2.18	-1.74	-2.70
Pool Elevation													
End of Month	158.37	159.76	163.06	164.59	164.97	165.05	164.48	163.11	161.16	159.42	157.55	155.40	
Maximum	160.37	159.76	163.06	165.06	164.97	165.32	165.16	164.50	163.11	161.16	159.42	157.55	
Minimum	158.37	157.50	159.76	163.06	164.37	164.70	164.38	163.11	161.16	159.42	157.55	155.40	
Pool Content EDM (1000 AC. FT.)	2256.88	2396.00	2747.17	2919.98	2963.91	2973.21	2907.34	2752.72	2541.39	2361.48	2177.25	1977.10	

B.A. STEINHAGEN LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC. FT)													
Avg 1908 thru 1988	80.8	155.6	286.6	430.3	435.9	504.0	498.4	579.9	295.2	148.9	87.7	72.7	3576.1
WY 1988	181.4	226.1	299.2	442.3	234.0	533.8	376.3	186.3	208.1	214.1	208.5	192.5	3332.7
Releases(1000 AC. FT)													
Avg 1952 thru 1988	102.1	142.5	250.9	322.6	351.8	421.5	375.6	547.8	306.8	188.9	129.6	114.4	3274.6
WY 1988	172.6	225.8	287.7	446.5	233.1	524.5	375.1	185.8	203.7	207.4	198.6	186.0	3246.9
Rainfall (inches)													
Avg 1970 thru 1988	3.87	5.34	5.54	4.35	3.86	4.22	4.15	6.42	5.69	3.17	3.04	4.17	53.82
WY 1988	0.78	9.67	8.27	4.54	2.41	6.74	2.85	1.91	4.67	5.31	2.17	2.00	51.32
Deviation	-3.09	4.33	2.73	0.19	-1.45	2.52	-1.30	-4.51	-1.02	2.14	-0.87	-2.17	-2.50
Pool Elevation													
End of Month	82.19	81.96	82.72	82.22	82.15	82.63	82.43	82.04	81.96	82.04	82.35	82.49	
Maximum	82.19	83.19	83.66	82.89	83.00	82.96	82.96	82.99	82.34	82.77	82.99	82.60	
Minimum	81.40	81.67	81.82	81.86	82.12	81.80	81.98	81.67	81.44	81.31	82.04	81.10	
Pool Content EDM (1000 AC. FT.)	83.63	80.79	90.47	84.00	83.13	89.28	86.68	81.77	80.79	81.77	85.65	87.45	

TRINITY RIVER BASIN

BENBROOK LAKE

Inflows(1000 AC. FT.)
Avg 1924 thru 1988
WY 1988

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	2.7	2.4	2.4	2.8	5.7	6.9	8.8	11.5	6.3	1.7	1.1	1.5	53.8
	0.7	1.0	1.3	0.7	0.9	1.4	0.7	0.3	4.0	0.8	0.3	2.4	14.4

Releases(1000 AC. FT.)
Avg 1993 thru 1988
WY 1988

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	1.1	3.5	1.6	1.9	3.2	5.0	4.3	8.2	11.2	2.0	1.2	0.9	44.1
	1.3	0.5	2.3	0.4	0.3	0.3	0.6	0.9	0.8	1.1	2.9	1.7	13.1

Rainfall (inches)
Avg 1953 thru 1988
WY 1988
Deviation

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	3.20	2.10	1.88	1.55	1.80	-2.37	3.59	4.38	3.14	2.29	2.00	3.23	31.53
	0.26	3.06	4.11	0.53	0.62	1.23	1.55	1.00	3.29	1.46	1.17	5.21	24.49
	-2.94	0.96	2.23	-1.02	-1.18	-1.14	-2.04	-3.38	0.15	-0.83	-0.83	2.98	-7.04

Pool Elevation
End of Month
Maximum
Minimum

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	691.40	691.24	690.73	690.64	690.57	690.48	690.05	689.26	689.60	688.70	687.06	685.65	
	692.15	691.40	691.24	690.73	690.64	690.66	690.48	690.05	690.10	689.62	688.70	687.06	
	691.40	691.22	690.57	690.64	690.57	690.48	690.05	689.26	689.26	688.70	687.06	686.52	

Pool Content EDM
(1000 AC. FT.)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	79.75	78.19	76.41	76.09	75.85	75.54	74.06	71.40	72.54	69.54	64.25	62.96	

JOE POOL LAKE

Inflows(1000 AC. FT.)
Avg 1987 thru 1988
WY 1988

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	1.9	2.3	4.1	2.1	7.4	2.8	1.3	8.4	6.1	1.8	1.3	2.8	42.3
	0.6	2.1	3.5	0.9	1.8	2.3	1.5	1.1	1.1	1.7	1.7	2.3	20.5

Releases(1000 AC. FT.)
Avg 1987 thru 1988
WY 1988

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	3.4
	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.1	0.2	0.3	3.2

Rainfall (inches)
Avg 1986 thru 1988
WY 1988
Deviation

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	3.00	3.12	2.53	0.96	2.94	1.15	2.09	4.49	4.55	2.91	0.96	3.56	32.16
	0.45	4.85	3.58	0.71	1.75	1.50	1.59	0.75	2.41	2.24	0.51	3.17	23.51
	-2.55	1.73	1.05	-0.15	-1.19	0.35	-0.50	-3.74	-2.14	-0.67	-0.45	-0.39	-8.65

Pool Elevation
End of Month
Maximum
Minimum

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	508.42	508.49	508.92	508.88	508.92	508.97	508.77	508.36	507.98	507.38	506.62	506.24	
	508.93	508.53	508.94	508.92	508.96	509.00	509.02	508.77	508.52	507.98	507.38	506.70	
	508.42	508.32	508.38	508.63	508.75	508.92	508.77	508.34	507.98	507.38	506.62	506.09	

Pool Content EDM
(1000 AC. FT.)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	91.80	92.16	94.37	94.17	94.37	94.63	93.60	91.49	89.57	86.58	82.87	81.09	

• TRINITY RIVER BASIN

RAY ROBERTS LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC. FT)													
Avg 1987 thru 1988	2.0	6.5	77.1	17.5	11.3	9.8	5.6	2.0	4.3	2.5	1.5	13.7	153.8
WY 1988	2.0	6.5	77.2	17.7	11.5	9.8	5.4	3.0	3.8	2.6	1.4	13.7	154.6
Releases(1000 AC. FT)													
Avg 1987 thru 1988	0.1*	0.1	0.1	0.1	0.1	0.1	0.1	-0.1	0.1	0.1	0.1	0.1	1.4
WY 1988	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.5
Rainfall (inches)													
Avg 1987 thru 1988	2.09	4.82	3.33	1.76	3.14	-2.14	1.57	5.55	4.13	2.13	1.85	3.73	36.26
WY 1988	1.40	6.10	5.00	1.25	0.60	2.50	3.10	1.90	0.60	2.60	0.50	4.30	29.85
Deviation	-0.69	1.28	1.57	-0.51	-2.54	0.36	1.53	-3.65	-3.53	0.47	-1.35	0.57	-6.41
Pool Elevation													
End of Month	571.50	573.40	588.90	591.06	592.29	593.15	593.37	593.16	593.05	592.63	591.95	593.03	
Maximum	571.50	573.40	588.80	591.06	592.29	593.15	593.41	593.37	593.50	593.05	592.63	593.04	
Minimum	571.33	571.50	573.40	568.80	591.06	592.29	593.15	593.07	593.05	592.63	591.95	591.93	
Pool Content EDM (1000 AC. FT.)	19.10	24.63	100.95	117.36	126.86	123.75	135.55	123.83	132.94	129.56	124.19	132.78	

LEWISVILLE LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC. FT)													
Avg 1924 thru 1988	40.0	29.5	27.1	24.7	44.2	57.9	70.6	96.6	54.4	17.6	10.4	27.7	500.6
WY 1988	3.9	27.8	65.3	20.2	12.6	11.2	8.6	2.5	11.9	8.4	4.2	11.2	187.7
Releases(1000 AC. FT)													
Avg 1955 thru 1988	26.1	38.1	38.5	25.2	28.2	35.5	35.4	66.6	78.9	39.5	28.6	21.2	461.7
WY 1988	5.2	5.1	15.4	13.8	15.7	13.1	13.5	15.9	11.0	10.6	10.1	5.4	134.8
Rainfall (inches)													
Avg 1955 thru 1988	3.52	2.50	1.99	1.62	2.22	2.91	3.97	5.07	3.30	2.05	2.06	3.92	35.13
WY 1988	0.14	6.16	4.04	0.83	0.78	1.86	1.55	0.59	4.46	3.52	0.52	3.43	27.88
Deviation	-3.38	3.66	2.05	-0.79	-1.44	-1.05	-2.42	-4.48	1.16	1.47	-1.54	-0.49	-7.25
Pool Elevation													
End of Month	512.04	512.75	514.74	514.79	514.34	513.85	513.13	511.85	511.21	510.24	508.89	508.48	
Maximum	512.75	512.75	514.74	514.95	514.79	514.39	513.88	513.13	512.23	511.21	510.24	509.10	
Minimum	512.04	511.89	512.19	514.73	514.34	513.80	513.13	511.81	511.21	510.24	508.89	508.38	
Pool Content EDM (1000 AC. FT.)	391.80	406.99	451.60	452.75	442.42	431.32	415.29	387.82	374.79	356.23	332.36	325.38	

TRINITY RIVER BASIN

GRAPEVINE LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC. FT.)													
Avg 1924 thru 1988	11.0	6.0	6.9	8.9	13.0	16.0	22.5	29.7	16.0	5.1	1.5	5.6	142.3
WY 1988	0.0	5.6	13.5	5.7	5.6	5.7	5.0	4.1	9.1	3.8	2.6	3.9	44.8
Releases(1000 AC. FT.)													
Avg 1953 thru 1988	4.4	7.4	10.1	8.2	5.6	6.0	9.6	12.0	16.8	12.5	10.1	5.0	107.7
WY 1988	2.3	2.0	2.0	2.0	1.7	1.5	1.5	2.2	2.4	5.2	6.8	6.6	36.3
Rainfall (inches)													
Avg 1953 thru 1988	3.21	2.38	1.95	1.57	1.93	2.63	3.72	4.89	3.02	2.23	1.97	3.63	33.12
WY 1988	0.13	5.03	3.53	0.81	0.85	1.62	1.26	1.13	4.61	2.83	0.57	5.47	27.84
Deviation	-3.08	2.65	1.58	-0.76	-1.08	-1.01	-2.46	-3.76	1.59	0.60	-1.40	1.84	-5.28
Pool Elevation													
End of Month	531.02	531.29	532.80	533.17	533.49	533.73	533.80	533.51	533.89	532.96	531.50	533.46	
Maximum	532.23	531.30	532.83	533.17	533.40	533.73	533.82	533.80	534.33	533.89	532.96	531.57	
Minimum	531.02	530.82	531.24	532.80	533.17	533.48	533.72	533.41	533.51	532.96	531.50	533.45	
Pool Content EDM (1000 AC. FT.)	153.41	155.20	165.45	168.03	170.20	171.97	172.47	170.41	173.11	166.56	156.60	149.74	

LAVON LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC. FT.)													
Avg 1924 thru 1988	13.7	19.2	24.6	24.7	36.2	38.8	50.7	66.6	37.5	12.5	3.0	11.6	339.1
WY 1988	1.8	27.6	67.1	33.1	24.1	28.4	24.6	8.2	11.1	11.2	8.4	9.8	255.4
Releases(1000 AC. FT.)													
Avg 1954 thru 1988	10.5	11.8	21.1	17.8	14.8	23.0	16.2	50.5	36.3	14.8	6.1	3.1	215.8
WY 1988	0.0	0.0	0.0	0.0	6.5	10.4	6.8	0.0	0.0	0.0	0.0	0.0	23.6
Rainfall (inches)													
Avg 1954 thru 1988	3.66	2.87	2.60	1.91	2.49	3.25	4.26	5.59	3.39	2.53	1.99	4.40	38.93
WY 1988	0.73	5.78	3.88	3.15	1.08	2.12	3.92	0.86	5.77	2.78	1.13	4.48	35.68
Deviation	-2.93	2.91	1.28	1.24	-1.41	-1.13	-0.34	-4.73	2.38	0.25	-0.86	0.08	-3.25
Pool Elevation													
End of Month	487.52	488.14	490.93	491.86	492.05	492.09	491.94	491.04	490.14	489.00	487.42	486.74	
Maximum	488.64	488.14	490.93	491.86	492.28	492.33	492.33	491.94	491.14	490.14	489.00	487.59	
Minimum	487.52	487.27	488.10	490.93	491.78	492.01	491.94	491.02	490.14	489.00	487.42	486.69	
Pool Content EDM (1000 AC. FT.)	367.15	378.87	434.07	453.94	457.60	458.45	455.25	436.34	417.99	395.45	365.28	352.68	

TRINITY RIVER BASIN

NAVARRO MILLS LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC. FT.)													
Avg 1907 thru 1988	5.8	6.5	9.4	9.3	10.6	11.8	17.4	27.6	14.4	3.5	1.4	2.8	120.3
WY 1988	0.7	5.2	17.5	5.3	14.3	6.9	3.9	1.4	2.9	0.6	0.8	4.0	43.5
Releases(1000 AC. FT.)													
Avg 1963 thru 1988	2.4	6.7	8.0	6.8	6.4	8.1	7.1	13.8	19.5	6.8	0.2	1.7	87.4
WY 1988	0.0	0.0	1.3	10.9	8.8	7.4	3.8	0.0	0.0	0.0	0.0	0.0	32.2
Rainfall (inches)													
Avg 1963 thru 1988	4.48	2.92	2.45	1.74	2.36	2.82	3.47	5.43	2.88	1.81	2.13	3.39	35.89
WY 1988	0.92	4.37	3.24	0.78	2.55	3.36	1.68	1.30	3.88	0.92	0.19	8.02	31.21
Deviation	-3.56	1.45	0.79	-0.96	0.19	0.54	-1.79	-4.13	1.00	-0.89	-1.94	4.63	-4.68
Pool Elevation													
End of Month	422.35	423.08	424.00	424.63	425.07	424.82	424.32	423.93	423.82	423.05	422.23	422.31	
Maximum	422.05	423.08	426.08	426.00	425.86	425.57	424.96	424.33	424.34	423.82	423.05	422.31	
Minimum	422.35	422.25	423.03	424.46	424.63	424.55	424.22	423.93	423.82	423.05	422.23	421.84	
Pool Content EDM (1000 AC. FT.)	46.58	47.96	64.81	57.62	61.45	58.59	56.05	54.11	53.57	49.83	46.04	46.40	

DARDWELL LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC. FT.)													
Avg 1938 thru 1988	3.7	3.0	4.9	4.0	6.4	6.7	10.3	12.6	7.3	1.7	0.7	1.9	63.0
WY 1988	0.6	3.3	8.1	0.9	3.9	4.3	2.7	1.7	2.0	1.2	0.8	2.1	31.8
Releases(1000 AC. FT.)													
Avg 1965 thru 1988	1.5	4.0	4.7	4.2	4.3	6.6	5.4	9.5	10.8	1.7	0.2	0.5	53.5
WY 1988	0.0	0.0	0.2	2.1	1.5	4.3	1.4	0.0	0.0	0.0	0.0	0.0	9.5
Rainfall (inches)													
Avg 1966 thru 1988	4.56	2.83	2.63	1.69	2.65	2.88	3.37	5.33	3.60	2.23	1.90	3.79	37.48
WY 1988	0.43	6.02	3.94	0.68	2.72	3.40	1.47	1.85	2.56	2.26	0.90	4.26	30.55
Deviation	-4.13	3.19	1.31	-1.01	0.13	0.52	-1.90	-3.48	-1.04	0.03	-1.00	0.47	-6.93
Pool Elevation													
End of Month	419.26	419.89	421.98	421.28	421.69	421.28	421.17	421.05	420.96	420.47	419.78	419.64	
Maximum	419.70	419.90	421.97	421.88	421.98	421.78	421.31	421.22	421.37	421.02	420.47	419.89	
Minimum	419.26	419.18	419.28	421.18	421.14	421.05	421.05	421.04	420.96	420.47	419.78	419.34	
Pool Content EDM (1000 AC. FT.)	46.26	48.40	55.48	53.29	54.78	53.29	52.90	52.47	52.15	50.42	48.02	47.54	

SAN JACINTO BASIN

BOYER RESERVOIR	OCT 87	NOV 87	DEC 87	JAN 88	FEB 88	MAR 88	APR 88	MAY 88	JUN 88	JUL 88	AUG 88	SEP 88	TOTAL
Inflows(1000 Ac.Ft.)													
Aug 1945 thru 1988	5.9	6.5	5.9	9.2	7.9	4.2	5.0	7.9	10.2	7.1	9.1	7.3	82.3
FY 88	1.4	4.2	7.2	3.1	1.4	7.7	5.0	3.0	3.7	1.8	3.9	2.1	49.5
Releases(1000 Ac.Ft.)													
Aug 1945 thru 1988	7.6	7.2	7.1	9.2	9.2	5.5	7.1	5.5	9.5	7.2	3.8	8.4	85.0
FY 88	1.4	4.2	7.2	3.1	1.4	5.3	5.5	4.7	3.7	1.8	3.9	2.1	49.5
Rainfall(Inches)													
Aug 1945 thru 1988	3.71	3.67	3.27	2.95	3.17	3.05	4.46	4.03	4.03	2.18	2.76	4.17	41.85
FY 88	.34	4.55	4.11	1.35	.97	5.12	2.88	1.15	2.09	1.50	2.54	1.50	28.81
Pool Elevation													
End of Month	73.69	74.27	74.32	73.70	72.82	74.43	85.83	73.65	73.51	73.87	73.79	74.30	
Maximum	74.39	77.41	83.96	76.41	74.01	88.43	86.15	85.03	82.52	74.18	76.95	78.05	
Minimum	73.59	73.59	73.59	73.59	73.59	73.59	73.59	73.59	73.59	73.59	73.59	73.59	
Pool Content (E.O.M.)													
(1000 Ac.Ft.)	0	0	0	0	0	1.22	1.22	0	0	0	0	0	0
ADLER'S RESERVOIR													
Inflows(1000 Ac.Ft.)													
Aug 1948 thru 1988	5.5	6.8	7.1	6.2	7.5	3.2	5.5	7.9	7.5	5.9	5.7	5.4	75.6
FY 88	1.7	5.4	7.9	3.2	4.7	6.9	9.3	2.3	3.5	2.4	4.9	1.5	50.0
Releases(1000 Ac.Ft.)													
Aug 1954 thru 1988	7.9	9.1	7.8	7.3	7.7	7.7	3.8	9.0	8.5	5.8	4.2	7.6	83.9
FY 88	1.7	5.1	9.0	3.3	1.7	3.1	4.9	3.7	3.5	2.3	4.7	1.4	49.7
Rainfall(Inches)													
Aug 1948 thru 1988	3.27	3.17	3.30	2.93	3.17	3.25	3.19	4.27	3.22	3.17	2.37	4.22	61.5
FY 88	.57	2.10	4.75	1.5	1.13	2.60	3.52	.96	2.24	2.12	1.63	1.15	28.69
Pool Elevation													
End of Month	71.81	72.12	71.97	71.79	71.74	85.13	90.65	71.80	71.80	71.82	71.75	72.02	
Maximum	71.96	81.28	85.94	79.80	72.73	86.42	86.62	85.85	84.95	79.87	80.40	78.23	
Minimum	71.95	71.65	71.59	71.59	71.70	71.65	71.57	71.59	71.59	71.57	71.75	71.69	
Pool Content (E.O.M.)													
(1000 Ac.Ft.)	0	0	0	0	0	1.32	1.11	0	0	0	0	0	0

BRAZOS RIVER BASIN

WHITNEY LAKE

Inflows(1000 AC. FT)
Avg 1899 thru 1988
WY 1988

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	115.8	64.6	65.4	54.8	58.6	68.1	129.9	263.9	168.7	94.1	67.7	103.0	1254.5
	4.6	17.6	26.5	18.5	12.1	17.0	8.9	10.1	67.1	7.3	6.0	14.6	210.3

Releases(1000 AC. FT)
Avg 1952 thru 1988
WY 1988

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	93.2	51.4	37.9	49.5	42.5	56.5	60.4	189.3	173.4	76.3	49.6	63.7	943.5
	22.7	21.3	37.6	22.5	20.5	12.9	19.9	1.5	26.3	22.9	3.1	7.8	233.4

Rainfall (inches)
Avg 1953 thru 1988
WY 1988
Deviation

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	3.55	2.45	2.01	1.59	1.95	2.34	3.58	4.55	3.49	2.34	2.20	3.37	33.41
	0.42	5.43	3.60	0.42	2.71	3.14	1.39	1.60	7.64	0.41	1.89	5.62	35.27
	-3.13	2.98	1.59	-1.17	0.75	0.80	-2.19	-2.95	4.15	-1.93	-0.31	3.25	1.85

Pool Elevation
End of Month
Maximum
Minimum

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	529.75	527.17	525.42	525.43	524.73	524.59	523.47	523.41	525.18	523.53	522.88	522.66	
	529.20	527.84	527.17	526.42	525.45	524.74	524.60	523.47	526.35	525.18	523.54	522.88	
	527.75	527.17	526.38	525.41	524.73	524.43	523.47	523.28	523.41	523.53	522.88	522.04	

Pool Content EOM
(1000 AC. FT.)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	513.18	501.00	486.75	468.75	456.52	453.42	435.25	434.26	464.34	436.25	425.51	421.91	

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AQUILLA LAKE

Inflows(1000 AC. FT)
Avg 1982 thru 1988
WY 1988

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	4.5	1.6	11.0	3.0	5.8	6.9	1.3	3.1	10.6	0.7	0.6	2.6	51.6
	0.4	5.6	13.8	4.0	5.0	5.9	1.5	0.7	3.2	0.2	0.5	1.9	42.7

Releases(1000 AC. FT)
Avg 1982 thru 1988
WY 1988

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	0.5	0.4	5.2	3.2	2.0	3.3	1.5	0.7	9.9	1.1	0.0	0.0	27.3
	0.1	0.1	3.3	12.9	2.8	4.2	2.1	0.1	0.1	0.1	0.1	0.1	25.7

Rainfall (inches)
Avg 1982 thru 1988
WY 1988
Deviation

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	7.55	2.99	4.18	1.00	2.83	2.28	1.74	3.96	6.51	0.73	1.21	5.46	40.43
	0.35	6.08	3.84	0.60	2.59	3.70	1.05	0.52	3.55	0.22	2.34	4.73	29.57
	-7.20	3.09	-0.34	-0.40	-0.24	1.42	-0.69	-3.44	-2.96	-0.51	1.13	-0.73	-10.86

Pool Elevation
End of Month
Maximum
Minimum

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	536.99	538.38	541.07	537.51	537.93	538.06	537.43	537.01	537.35	536.61	535.89	535.86	
	537.41	538.38	541.40	541.07	538.50	538.33	538.06	537.43	537.74	537.35	536.61	535.89	
	536.99	536.92	538.33	537.47	537.47	537.56	537.42	537.00	537.01	536.61	535.89	535.36	

Pool Content EOM
(1000 AC. FT.)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
	50.71	55.31	65.07	52.39	53.79	54.22	52.13	50.77	51.87	49.50	47.27	47.18	

BRAZOS RIVER BASIN

WACO LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC. FT.)													
Avg 1907 thru 1988	23.9	15.3	20.5	17.0	23.6	25.6	43.8	65.6	33.0	12.9	7.6	16.0	304.9
WY 1988	1.3	7.8	15.1	9.0	11.0	11.4	7.1	3.4	49.9	0.3	1.4	7.2	124.4
Releases(1000 AC. FT.)													
Avg 1966 thru 1988	7.4*	11.1	12.1	15.0	16.9	26.0	28.3	57.3	37.2	12.2	2.5	4.7	230.8
WY 1988	0.6	0.6	0.6	4.3	5.1	8.1	3.6	0.1	39.8	0.1	0.1	0.1	63.0
Rainfall (inches)													
Avg 1963 thru 1988	3.75	2.65	2.14	1.67	2.23	2.49	3.31	4.80	3.00	2.24	2.28	3.65	34.21
WY 1988	1.27	4.75	3.50	0.58	1.93	3.42	1.34	1.07	5.88	1.07	0.92	4.63	30.47
Deviation	-2.49	2.11	1.46	-1.09	-0.30	0.93	-1.97	-3.73	2.88	-1.17	-1.36	0.98	-3.74
Pool Elevation													
End of Month	452.84	453.28	454.83	455.08	455.39	455.18	454.96	454.52	454.96	453.80	452.66	452.64	
Maximum	453.56	453.29	454.88	455.38	455.79	455.39	455.22	454.96	459.44	454.96	453.80	452.66	
Minimum	452.84	452.74	453.25	454.88	455.08	455.05	454.94	454.52	454.52	453.80	452.66	451.84	
Pool Content EDM (1000 AC. FT.)	133.89	136.95	148.32	149.77	152.02	150.49	148.90	145.73	148.90	140.61	132.65	132.51	

PROCTOR LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC. FT.)													
Avg 1922 thru 1988	3.4	1.9	1.5	3.6	2.6	4.9	5.2	12.8	9.0	2.5	1.1	2.8	51.4
WY 1988	0.1	1.4	1.2	0.9	0.8	1.2	1.1	4.6	69.0	11.0	0.7	0.4	92.3
Releases(1000 AC. FT.)													
Avg 1964 thru 1988	2.7	2.2	2.2	3.4	5.6	4.8	8.0	9.7	13.7	13.9	5.2	2.8	74.2
WY 1988	0.8	0.2	0.2	0.2	0.2	0.2	0.4	1.0	32.4	26.3	5.4	2.2	69.4
Rainfall (inches)													
Avg 1964 thru 1988	2.90	1.97	1.40	1.42	1.70	2.12	2.93	4.78	3.41	1.61	2.21	3.64	30.09
WY 1988	0.17	2.13	1.29	0.23	0.33	1.23	1.54	3.21	9.38	3.25	0.20	2.48	25.44
Deviation	-2.73	0.16	-0.11	-1.19	-1.37	-0.89	-1.39	-1.57	5.97	1.64	-2.01	-1.16	-4.65
Pool Elevation													
End of Month	1161.07	1160.99	1161.00	1160.94	1160.86	1160.61	1160.19	1160.35	1166.90	1163.13	1160.96	1159.85	
Maximum	1161.70	1161.07	1161.03	1161.01	1160.94	1160.90	1160.63	1160.35	1170.29	1166.90	1163.13	1160.96	
Minimum	1161.06	1160.90	1160.89	1160.92	1160.86	1160.59	1160.19	1159.61	1160.35	1163.13	1160.96	1159.75	
Pool Content EDM (1000 AC. FT.)	55.20	54.85	54.89	54.63	54.28	53.20	51.42	52.09	84.72	64.74	54.72	50.00	

BRAZOS RIVER BASIN

BELTON LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC. FT.)													
Avg 1908 thru 1988	30.4	20.4	30.2	29.7	34.9	37.0	60.4	97.1	51.6	24.6	13.9	25.1	455.0
WY 1988	1.9	8.8	11.4	4.9	7.3	9.1	5.0	5.4	70.8	24.5	11.4	5.8	145.3
Releases(1000 AC. FT.)													
Avg 1955 thru 1988	22.4	20.7	18.1	25.6	24.8	34.7	29.8	53.7	61.0	49.6	17.5	11.1	349.0
WY 1988	1.5	1.2	1.2	1.2	1.1	5.5	2.4	8.0	39.8	27.3	44.8	3.2	137.4
Rainfall (inches)													
Avg 1954 thru 1988	3.85	2.55	1.95	1.68	2.30	2.11	3.26	4.46	3.56	1.94	2.29	3.65	33.60
WY 1988	0.30	4.17	3.26	0.41	1.23	2.60	0.98	1.60	5.39	3.61	0.98	1.31	25.84
Deviation	-3.55	1.62	1.31	-1.27	-1.07	0.49	-2.28	-2.86	1.83	1.67	-1.31	-2.34	-7.76
Pool Elevation													
End of Month	593.31	593.51	594.03	594.02	594.23	594.09	593.78	592.89	594.64	593.49	589.65	589.04	
Maximum	593.96	593.53	594.03	594.05	594.23	594.35	594.09	593.78	596.03	594.64	593.49	589.65	
Minimum	593.31	593.13	593.35	593.99	593.98	594.06	593.77	592.87	592.89	593.49	589.65	588.87	
Pool Content EOM													
(1000 AC. FT.)	433.47	435.93	442.36	442.23	444.85	443.10	439.26	428.35	449.99	435.68	390.17	383.23	

STILLHOUSE HOLLOW LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC. FT.)													
Avg 1924 thru 1988	13.5	9.4	12.9	15.2	21.2	22.4	24.5	43.1	16.4	10.1	4.4	10.0	203.1
WY 1988	1.6	4.7	7.1	4.6	5.0	6.3	3.7	2.9	9.4	5.7	1.7	0.7	53.5
Releases(1000 AC. FT.)													
Avg 1968 thru 1988	7.1	7.7	8.7	14.8	12.1	15.6	17.3	29.7	23.9	25.8	3.9	5.5	172.0
WY 1988	0.0	0.0	4.1	4.9	1.2	6.1	1.8	14.4	1.7	48.7	0.0	0.0	82.8
Rainfall (inches)													
Avg 1967 thru 1988	3.71	2.50	1.95	1.56	2.43	2.45	2.94	4.54	3.71	2.15	2.40	3.52	33.87
WY 1988	0.35	4.77	3.47	0.41	1.13	2.51	1.41	1.07	3.36	4.15	0.61	1.04	24.28
Deviation	-3.36	2.27	1.52	-1.15	-1.30	0.06	-1.53	-3.47	-0.35	2.00	-1.79	-2.48	-9.59
Pool Elevation													
End of Month	621.85	622.32	622.53	622.26	622.59	622.22	622.09	619.67	620.25	612.00	611.47	610.99	
Maximum	622.07	622.32	622.60	622.53	622.59	622.72	622.31	622.09	620.27	620.25	612.00	611.47	
Minimum	621.84	621.92	622.16	621.98	622.26	622.09	622.04	619.67	619.60	612.00	611.47	610.94	
Pool Content EOM													
(1000 AC. FT.)	234.74	237.77	239.13	237.38	239.52	237.12	236.28	221.02	224.62	177.33	174.58	172.12	

BRAZOS RIVER BASIN

GEORGETOWN LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC. FT.)													
Avg 1980 thru 1988	12.1	8.0	17.9	9.4	19.0	16.5	7.5	22.3	41.9	15.7	3.6	8.2	182.1
WY 1988	0.5	1.3	1.3	1.2	1.0	1.0	0.8	0.7	2.9	1.3	0.4	0.0	12.3
Releases(1000 AC. FT.)													
Avg 1980 thru 1988	1.6	1.4	4.1	2.9	5.3	7.1	2.5	4.2	7.9	13.3	0.6	3.1	54.0
WY 1988	0.5	0.4	0.5	0.7	0.7	0.5	0.6	0.3	0.3	0.3	0.3	0.3	5.6
Rainfall (inches)													
Avg 1981 thru 1988	5.05	3.09	2.42	1.02	2.69	-2.44	1.99	5.10	5.34	1.50	1.82	2.90	36.22
WY 1988	0.30	7.23	3.15	0.47	0.74	1.79	2.15	3.11	3.27	1.25	2.17	1.39	27.57
Deviation	-4.25	3.39	0.67	-0.55	-1.95	-0.65	0.16	-1.99	-2.07	-0.25	0.35	-1.51	-8.66
Pool Elevation													
End of Month	790.10	790.22	790.20	790.76	790.73	790.70	790.31	789.97	791.23	791.07	790.00	788.79	
Maximum	790.51	790.35	790.70	790.78	790.76	790.75	790.71	790.31	791.63	791.51	791.07	790.00	
Minimum	790.10	789.97	790.10	790.70	790.70	790.53	790.31	789.97	789.97	790.85	790.00	788.76	
Pool Content EDM (1000 AC. FT.)	35.92	36.21	36.69	36.77	36.73	36.69	36.19	35.75	37.38	37.17	35.79	34.28	

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GRANGER LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC. FT.)													
Avg 1980 thru 1988	12.5	9.0	18.4	9.8	19.4	17.0	7.8	22.7	42.6	19.8	3.7	8.3	187.0
WY 1988	4.2	9.8	6.0	4.9	5.1	5.2	3.4	4.5	9.7	2.2	1.3	1.0	57.3
Releases(1000 AC. FT.)													
Avg 1980 thru 1988	6.4	7.5	14.4	12.8	10.3	18.1	7.9	16.0	27.3	30.2	2.8	6.9	162.6
WY 1988	2.1	4.2	7.8	5.9	4.6	3.0	2.7	1.1	7.2	1.1	0.3	0.3	40.4
Rainfall (inches)													
Avg 1981 thru 1988	4.33	2.93	2.83	1.15	1.94	2.31	1.31	5.23	5.90	1.30	1.19	2.17	32.61
WY 1988	1.03	5.28	1.89	0.48	0.67	1.80	1.31	3.02	3.86	1.87	0.39	0.08	21.68
Deviation	-3.30	2.35	-0.94	-0.67	-1.27	-0.51	0.00	-2.21	-2.04	0.57	-0.80	-2.09	-10.93
Pool Elevation													
End of Month	504.33	505.23	504.66	504.28	504.17	504.33	504.11	504.37	504.37	503.99	503.46	502.98	
Maximum	504.36	505.28	505.23	504.66	504.55	504.55	504.33	504.40	506.15	504.37	503.99	503.46	
Minimum	504.06	504.26	504.33	504.06	504.17	504.08	504.05	504.11	504.26	503.99	503.46	502.93	
Pool Content EDM (1000 AC. FT.)	66.97	71.01	68.44	66.74	66.26	66.97	65.99	67.14	67.14	65.46	63.18	61.18	

GUADALUPE RIVER BASIN

CANYON LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC. FT.)													
Avg 1915 thru 1988	31.0	16.6	18.5	20.7	21.2	23.5	30.1	39.0	35.6	23.7	18.2	26.1	304.2
WY 1988	21.9	25.1	21.7	17.5	15.0	16.6	13.3	22.6	17.3	61.4	23.6	14.5	269.7
Reserves(1000 AC. FT.)													
Avg 1958 thru 1988	19.4	19.0	14.5	18.4	18.4	20.3	21.6	24.8	32.5	31.8	28.7	17.7	268.3
WY 1988	27.4	12.0	3.9	4.1	4.1	4.5	5.3	12.8	18.2	23.3	39.3	10.9	159.7
Painfall (inches)													
Avg 1963 thru 1988	3.57	2.74	1.52	1.51	1.90	1.84	2.75	4.51	3.50	2.11	3.07	4.22	32.85
WY 1988	0.55	6.37	1.93	0.72	0.43	2.30	1.63	5.34	2.53	1.79	2.72	2.12	28.53
Deviation	-2.92	3.63	0.11	-1.07	-1.47	0.46	-1.12	0.83	-0.97	-0.32	-0.35	-2.10	-5.32
Pool Elevation													
End of Month	900.98	902.45	904.55	906.09	907.27	908.45	909.01	909.73	909.09	911.81	907.14	908.76	
Maximum	902.56	902.45	904.55	906.09	907.27	908.45	909.04	909.77	909.77	912.78	911.81	909.14	
Minimum	900.98	900.94	902.45	904.55	906.09	907.27	908.45	909.73	908.93	909.82	909.14	908.76	
Pool Content EDM (1000 AC. FT.)	319.41	320.35	346.43	358.52	367.93	377.40	382.08	388.05	382.74	403.65	383.15	381.67	

COLORADO RIVER BASIN

HORDS CREEK LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC.FT)													
Avg 1942 thru 1988	0.3	0.1	0.1	0.1	0.1	0.1	0.5	1.0	0.5	0.2	0.1	0.3	3.4
WY 1988	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.1	0.5
Releases(1000 AC.FT)													
Avg 1952 thru 1988	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.0	0.0	0.0	0.7
WY 1988	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainfall (inches)													
Avg 1949 thru 1988	2.65	1.46	1.01	1.15	1.09	1.34	2.47	3.74	3.07	1.89	2.13	3.23	25.24
WY 1988	0.16	0.42	1.47	0.10	0.51	0.70	0.91	2.20	5.10	1.95	0.28	2.42	16.50
Deviation	-2.49	-1.04	0.48	-1.05	-0.58	-0.64	-1.56	-1.54	2.03	0.06	-1.85	-0.75	-2.94
Pool Elevation													
End of Month	1895.17	1895.76	1895.60	1895.34	1895.12	1894.68	1894.18	1893.70	1893.50	1892.84	1891.97	1891.41	
Maximum	1895.76	1895.17	1895.76	1895.60	1895.34	1895.12	1894.68	1894.18	1894.05	1893.50	1892.84	1891.97	
Minimum	1895.17	1895.76	1895.60	1895.34	1895.12	1894.68	1894.18	1893.70	1893.45	1892.84	1891.97	1891.41	

Pool Content EDM
(1000 AC. FT.)

6.35	6.18	6.11	6.01	5.92	5.75	5.56	5.38	5.31	5.07	4.78	4.59	
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VII-53

MARSHALL FORD LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC.FT)													
Avg 1941 thru 1988	126.7	62.4	58.0	77.1	78.7	85.8	114.0	221.2	180.0	95.0	82.0	105.6	1265.4
WY 1988	24.1	53.2	52.1	47.2	53.4	42.4	40.1	50.6	108.2	137.5	88.6	82.8	742.3
Releases(1000 AC.FT)													
Avg 1944 thru 1988	62.2	61.3	48.1	48.1	51.1	70.5	95.9	164.9	188.4	129.0	115.0	52.0	1132.3
WY 1988	102.0	5.4	4.6	7.1	8.7	102.0	60.2	101.6	109.2	112.9	100.5	51.1	655.4
Rainfall (inches)													
Avg 1952 thru 1988	3.27	1.97	1.40	1.14	1.77	1.54	2.64	4.12	3.26	1.85	2.17	3.17	23.35
WY 1988	0.49	8.00	0.85	0.23	1.33	1.95	0.37	3.09	1.53	2.82	2.05	0.20	22.75
Deviation	-2.78	6.03	-0.72	-0.91	-0.44	0.42	-2.27	-1.09	-1.73	0.97	-0.12	-2.97	-9.60
Pool Elevation													
End of Month	670.55	673.15	675.75	677.85	679.01	675.42	673.88	670.40	669.78	670.67	669.32	668.23	
Maximum	675.06	673.18	675.79	677.85	679.01	675.42	673.88	670.40	669.78	670.67	669.32	668.23	
Minimum	670.59	670.59	673.18	675.79	677.85	675.42	673.88	670.40	669.78	670.67	669.32	668.23	
Pool Content EDM (1000 AC. FT.)	987.42	1030.81	1076.16	1113.11	1134.36	1069.63	1042.81	984.30	974.18	958.73	965.25	949.05	

COLORADO RIVER BASIN

TWIN BUTTES LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC. FT.)													
Avg 1963 thru 1988	7.1	3.8	3.8	3.8	3.7	3.8	5.3	8.3	4.6	2.4	6.4	8.5	61.4
WY 1988	3.8	4.5	4.0	6.7	4.3	4.2	4.3	6.4	5.6	5.0	2.1	8.0	58.9
Releases(1000 AC. FT.)													
Avg 1963 thru 1983	1.5	1.6	1.4	0.9	1.2	1.7	2.9	4.6	3.6	5.4	4.1	1.8	30.5
WY 1988	0.0	0.0	0.0	0.0	0.0	1.5	3.8	2.1	3.0	5.1	5.8	0.8	22.0
Rainfall (inches)													
Avg 1964 thru 1989	2.10	0.94	0.66	0.59	1.02	0.88	1.37	2.51	2.01	1.06	1.65	2.86	17.64
WY 1988	0.34	0.80	3.56	0.01	0.42	0.95	1.36	4.34	3.05	1.87	0.86	3.11	20.77
Deviation	-1.76	-0.14	3.00	-0.58	-0.50	0.07	-0.01	1.83	1.04	0.81	-0.79	0.25	3.13
Pool Elevation													
End of Month	1935.31	1935.59	1935.88	1936.56	1936.86	1936.67	1936.19	1936.14	1935.78	1935.02	1933.68	1934.04	
Maximum	1935.32	1935.59	1935.88	1936.56	1936.86	1936.92	1936.69	1936.19	1936.15	1935.78	1935.02	1934.05	
Minimum	1935.16	1935.31	1935.59	1935.88	1936.56	1936.69	1936.19	1935.83	1935.47	1935.02	1933.68	1933.29	
Pool Content EDM (1000 AC. FT.)	137.64	139.73	141.92	147.16	147.52	148.18	144.29	143.90	141.16	135.50	125.96	129.47	

VII-54

D. C. FISHER LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC. FT.)													
Avg 1915 thru 1988	3.8	0.4	0.4	0.3	0.5	1.1	3.7	5.7	2.8	3.0	1.6	7.0	30.4
WY 1988	0.1	0.3	1.3	0.7	0.9	1.0	1.1	1.4	0.8	1.2	0.6	2.8	12.2
Releases(1000 AC. FT.)													
Avg 1953 thru 1988	1.6*	0.2	0.2	0.1	0.1	0.1	0.1	0.5	0.3	0.5	0.5	0.3	4.5
WY 1988	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainfall (inches)													
Avg 1953 thru 1988	2.61	1.09	0.95	0.74	0.94	0.93	1.85	3.23	2.23	1.68	2.13	3.02	21.20
WY 1988	0.31	0.93	2.90	0.02	0.27	0.34	1.37	2.92	1.81	3.87	0.71	3.08	18.43
Deviation	-2.30	-0.16	1.95	-0.72	-0.67	-0.59	-0.48	-0.31	-0.42	2.19	-1.42	0.06	-2.87
Pool Elevation													
End of Month	1896.03	1895.71	1895.80	1895.71	1895.56	1895.07	1894.57	1894.16	1893.50	1892.91	1891.93	1891.92	
Maximum	1896.66	1896.05	1895.82	1895.80	1895.71	1895.56	1895.09	1894.57	1894.18	1893.50	1892.91	1892.13	
Minimum	1896.05	1895.71	1895.56	1895.71	1895.56	1895.07	1894.57	1894.14	1893.50	1892.91	1891.93	1891.40	
Pool Content EDM (1000 AC. FT.)	64.95	63.84	64.13	63.84	63.35	61.84	60.19	58.91	56.88	55.08	52.16	52.14	

BRAZOS RIVER BASIN

SOMERVILLE LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows(1000 AC. FT.)													
Avg 1924 thru 1988	12.7	15.2	17.0	20.9	23.7	19.6	26.1	36.4	25.4	11.6	3.6	9.3	221.4
WY 1988	0.6	5.2	7.2	3.4	4.3	5.7	5.2	4.5	7.8	2.3	4.0	3.4	53.5
Releases(1000 AC. FT.)													
Avg 1967 thru 1988	8.1*	9.4	19.4	12.2	18.4	17.9	19.8	27.1	32.0	24.5	7.2	4.7	200.6
WY 1988	0.0	0.0	0.0	0.0	0.0	0.0	1.7	4.3	0.0	0.0	3.3	15.5	32.8
Rainfall (inches)													
Avg 1967 thru 1988	4.02	3.17	2.59	2.57	2.46	2.52	2.38	5.03	3.92	1.80	2.23	4.10	27.29
WY 1988	0.15	3.44	3.23	0.93	1.25	2.23	2.46	2.13	1.97	0.64	2.04	0.22	21.02
Deviation	-3.87	0.27	0.79	-1.64	-1.11	-0.19	-0.42	-2.95	-1.85	-1.16	-0.19	-3.88	-15.24
Pool Elevation													
End of Month	237.35	237.53	237.95	238.03	238.20	238.39	238.33	237.86	237.97	237.52	236.82	235.23	
Maximum	237.77	237.55	237.97	238.06	238.20	238.39	238.43	238.36	238.28	237.97	237.52	236.82	
Minimum	237.35	237.28	237.50	237.94	238.03	238.11	238.10	237.83	237.86	237.52	236.82	235.23	
Pool Content EOM (1000 AC. FT.)	152.77	154.78	159.54	160.45	162.41	164.62	163.92	158.51	159.77	154.67	146.93	130.24	

COLORADO RIVER BASIN

NAVAJO DAM

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft)													
FY 1988	32.65	46.28	20.93	20.11	26.78	61.98	96.11	124.19	116.38	46.18	74.67	47.31	713.58
Releases (1000 Ac-Ft)													
FY 1988	38.83	36.00	37.20	37.20	34.80	37.20	36.00	37.20	36.11	39.81	38.92	36.33	445.60
Rainfall (Inches)	Data Unavailable												
Pool Elevation (EOM)	6037.42	6038.33	6036.74	6035.05	6034.21	6036.34	6040.73	6046.69	6051.10	6048.87	6049.88	6049.43	
Maximum	6038.45	6068.62	6038.29	6036.65	6035.05	6036.34	6040.73	6046.69	6051.10	6051.20	6049.88	6050.00	
Minimum	6037.30	6037.51	6036.74	6035.05	6033.88	6034.46	6036.34	6040.90	6046.81	6048.87	6048.65	6049.43	
Pool Content (EOM)													
(1000 Ac-Ft)	1082.30	1091.90	1075.11	1057.53	1048.87	1070.93	1117.60	1183.77	1234.90	1208.82	1220.57	1215.32	

PLATERO RESERVOIR

RIO GRANDE BASIN

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft) FY 1988	.73	.84	.45	.50	.32	.49	2.67	11.84	19.01	4.90	3.66	2.19	47.60
Releases (1000 Ac-Ft) FY 1988	.73	1.01	.61	.61	.57	.38	.80	12.10	20.24	12.83	8.94	2.81	61.63

Rainfall (Inches)
DATA IS NOT AVAILABLE

Pool Elevation(EDM) Maximum	10016.7	10016.5	10016.3	10016.14	10015.84	10015.96	10018.02	10017.95	10016.41	10006.23	9998.61	9997.47	
Minimum	10016.8	10016.8	10016.4	10016.30	10016.19	10015.96	10018.02	10018.50	10017.82	10016.25	10005.65	9998.56	
Pool Content (EDM) (1000 Ac-Ft)	43.96	43.79	43.62	43.49	43.24	43.39	45.08	45.02	43.72	35.55	29.99	29.19	

ABIQUITU DAM

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft) Avg 1926 thru 1988 FY 1988	12.08 13.44	13.79 13.42	12.17 10.79	5.43 9.57	9.73 10.93	19.69 21.32	51.02 50.00	96.77 73.16	52.75 25.20	25.82 22.34	25.63 23.84	18.01 16.54	342.90 290.60
Releases (1000 Ac-Ft) Avg 1963 thru 1988 FY 1988	13.37 75.21	22.81 42.39	21.71 3.19	10.70 3.21	12.59 2.91	22.85 27.12	46.35 48.84	67.53 66.28	55.40 30.00	31.97 19.30	24.02 19.48	17.70 13.04	346.99 350.97
Rainfall (Inches) Avg 1957 thru 1988 FY 1988	.96 .44	.52 1.22	.37 .39	.40 .96	.27 .04	.55 .01	.56 .93	.82 1.82	.74 1.34	1.66 2.02	1.97 5.07	1.17 1.32	9.99 15.56
Pool Elevation (EDM) Maximum	6222.04	6214.72	6216.52	6218.02	6219.89	6218.15	6218.06	6219.22	6217.50	6217.67	6218.29	6218.75	
Minimum	6235.74	6221.54	6216.52	6218.02	6219.89	6220.76	6218.31	6220.38	6218.86	6217.78	6218.60	6219.04	
Pool Content (EDM) (1000 Ac-Ft)	199.81	170.11	177.21	183.23	190.86	183.76	183.39	188.11	181.13	181.82	184.34	186.19	

RIO GRANDE BASIN

COCHITI LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
InFlows (1000 Ac-Ft)													
Avg 1910 thru 1988	49.30	54.77	48.96	41.50	47.60	80.91	138.87	272.08	204.19	85.68	57.41	44.32	1125.59
FY 1988	81.00	67.04	38.18	39.03	45.86	84.74	124.06	112.74	67.71	48.60	56.74	54.77	820.48
Releases (1000 Ac-Ft)													
Avg 1975 thru 1988	39.78	53.18	57.43	52.34	63.25	88.77	142.40	235.24	217.59	139.72	66.58	48.89	1205.17
FY 1988	36.81	52.36	58.50	65.05	93.91	133.05	161.82	140.23	73.89	48.54	46.41	61.95	972.55
Rainfall (Inches)													
Avg 1967 thru 1988	1.19	.73	.62	.61	.40	.65	.72	.98	.79	1.79	2.27	1.61	12.33
FY 1988	.44	.80	.40	.57	.22	.13	1.97	1.33	1.48	2.04	3.30	3.23	15.91
Pool Elevation (EDM)													
Maximum	5408.39	5411.45	5406.71	5400.30	5386.95	5370.65	5354.15	5336.74	5331.24	5330.63	5338.25	5332.31	
Minimum	5408.39	5413.34	5411.21	5406.50	5399.85	5386.69	5369.45	5353.67	5336.04	5331.48	5338.25	5341.50	
	5398.38	5408.92	5406.71	5400.30	5386.95	5370.65	5354.15	5336.74	5331.24	5330.63	5330.64	5331.82	
Pool Content (EDM)													
(1000 Ac-Ft)	259.72	273.43	252.39	221.86	172.89	121.31	84.43	55.92	48.93	48.24	57.95	50.19	

GALISTEO DAM

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
InFlows (1000 Ac-Ft)													
Avg 1971 thru 1988													
FY 1988													
Releases (1000 Ac-Ft)													
Avg 1971 thru 1988	.42	.09	.09	.08	.10	.15	.21	.29	.25	1.14	.97	.70	4.49
FY 1988	.0	.04	.03	.03	.16	.10	.14	.10	.16	.83	1.64	1.59	4.83
Rainfall (Inches)													
Avg 1971 thru 1988	1.12	.66	.41	.44	.55	.45	.73	.87	.63	1.47	1.69	1.27	10.29
FY 1988	.51	.60	.37	.32	.21	.02	1.34	.40	1.22	2.51	4.51	2.62	14.63

NO END OF MONTH STORAGE DURING THE YEAR

Pool Elevation (EDM)

Maximum

Minimum

Pool Content (EDM)

(1000 Ac-Ft)

0 0 0 0 0 0 0 0 0 0 0 0 0 0

JEMEZ CANYON DAM

RIO GRANDE BASIN

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft)													
Avg 1921 thru 1988	2.41	1.84	1.60	1.66	1.94	4.25	18.26	15.04	2.89	1.29	2.44	1.69	55.31
FY 1988	.49	2.85	1.37	1.87	1.22	3.75	12.20	6.79	1.84	2.05	5.40	8.60	48.43
Releases (1000 Ac-Ft)													
Avg 1954 thru 1988	1.97	2.00	1.40	1.56	1.72	3.80	10.99	12.69	6.19	2.98	2.79	1.56	49.67
FY 1988	.15	3.12	1.13	1.69	.90	.77	6.03	10.17	1.77	2.15	3.82	9.46	41.17
Rainfall (Inches)													
Avg 1953 thru 1988	1.05	.49	.44	.38	.36	.47	.44	.65	.57	1.30	1.58	1.19	8.92
FY 1988	.65	.65	.42	.19	.06	.01	2.44	.42	1.86	1.67	2.06	3.60	14.03
Pool Elevation (EDM)													
Maximum	5195.23	5194.77	5194.64	5194.68	5194.60	5193.36	5200.10	5197.00	5196.36	5195.31	5195.92	5194.77	
Minimum	5195.45	5195.40	5194.99	5194.84	5194.78	5196.36	5200.10	5200.58	5196.85	5196.39	5195.92	5196.51	
	5195.23	5194.76	5194.63	5194.62	5194.60	5194.59	5196.57	5197.00	5296.16	5195.27	5195.04	5194.79	
Pool Content (EDM)													
(1000 Ac-Ft)	27.37	26.75	26.58	26.63	26.53	28.90	34.25	29.79	28.90	27.47	28.30		26.75

SANTA ROSA LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft)													
Avg 1981 thru 1988	3.78	2.37	1.77	1.75	2.15	4.77	9.22	20.36	18.75	8.56	14.61	8.61	96.70
FY 1988	1.48	1.53	1.74	1.66	1.81	2.10	2.77	7.57	8.51	13.23	17.09	24.61	84.12
Releases (1000 Ac-Ft)													
Avg 1981 thru 1988	.89	1.17	.68	.68	1.05	1.80	2.12	13.51	13.45	15.51	10.77	11.63	73.25
FY 1988	.21	.08	.86	1.22	.10	.03	.05	6.85	15.68	16.37	15.95	40.93	98.34
Rainfall (Inches)													
Avg 1981 thru 1988	1.82	1.06	.71	.49	.44	.57	.98	1.72	2.13	1.70	3.36	1.96	16.93
FY 1988	.02	.89	.78	.25	.04	.16	2.39	1.81	3.33	4.07	1.33	4.11	19.18
Pool Elevation (EDM)													
Maximum	4747.45	4747.55	4747.53	4747.46	4747.59	4747.58	4747.86	4747.51	4745.12	4743.65	4743.55	4738.23	
Minimum	4747.51	4747.55	4747.55	4747.59	4747.59	4747.62	4747.86	4748.02	4748.34	4744.47	4746.03	4743.64	
	4747.40	4747.45	4747.45	4747.46	4747.46	4747.58	4747.59	4747.51	4745.12	4742.38	4743.55	4738.23	
Pool Content (EDM)													
(1000 Ac-Ft)	111.36	111.75	111.67	111.40	111.91	111.87	112.98	111.60	102.44	97.06	96.70		78.82

RIO GRANDE BASIN

TWO RIVERS RESERVOIR

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft)													
Avg 1964 thru 1988	1.12	.92	.77	.82	.65	.88	1.15	.91	.51	.43	1.41	1.79	11.37
FY 1988	.04	.61	1.79	2.06	2.23	1.40	.43	.34	.0	.84	4.11	6.38	20.24
Releases (1000 Ac-Ft)													
Avg 1964 thru 1988	1.12	.91	.77	.83	.66	.88	1.15	.91	.47	.45	1.41	1.79	11.35
FY 1988	.04	.61	1.79	2.06	2.23	1.40	.43	.34	.0	.84	4.11	6.38	20.24
Rainfall (Inches)													
Avg 1964 thru 1986	.91	.38	.17	.18	.30	.22	.34	.68	1.55	1.77	2.77	1.89	10.82
FY 1988	Data Unavailable												

Pool Elevation (EDM)	0	0	0	0	0	0	0	0	0	0	0	0	0
Maximum	0	0	0	3984.58	0	0	0	0	0	0	0	0	0
Minimum	0	0	0	0	0	0	0	0	0	0	0	0	0
Pool Content (EDM)	0	0	0	0	0	0	0	0	0	0	0	0	0
(1000 AC-FT)													

SUNNER LAKE

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	TOTAL
Inflows (1000 Ac-Ft)													
FY 1988	Data Unavailable												
Releases (1000 Ac-Ft)													
FY 1988	13.25	.20	.11	.19	2.92	5.97	4.35	36.45	17.66	23.96	18.19	52.25	175.50
Rainfall (Inches)													
FY 1988	.22	.40	.24	.16	.07	.03	1.08	1.65	1.95	5.70	2.00	2.88	16.38
Pool Elevation (EDM)	4250.8	4253.4	4255.9	4258.5	4259.0	4258.0	4257.7	4245.6	4245.7	4247.9	4246.8	4244.5	
Maximum	4255.3	4253.4	4255.9	4258.5	4259.2	4259.0	4258.2	4257.7	4247.1	4248.5	4247.9	4247.8	
Minimum	4250.8	4250.8	4253.4	4255.9	4258.5	4258.0	4257.7	4244.1	4245.2	4245.7	4246.8	4241.3	
Pool Content (EDM)													
(1000 Ac-Ft)	27.45	32.62	38.20	44.63	45.94	43.34	42.58	19.03	19.17	22.44	20.74	17.44	

**SECTION VIII - MINUTES OF THE ARKANSAS RIVER COORDINATING COMMITTEE
MEETING AND THE ANNUAL RESERVOIR CONTROL CENTER MEETING**

- 1. RESERVOIR CONTROL CENTER**
- 2. ARKANSAS RIVER BASIN**

MINUTES

1988 ANNUAL RESERVOIR CONTROL CENTER MEETING SOUTHWESTERN DIVISION CORPS OF ENGINEERS 16 and 17 NOVEMBER 1988

I. INTRODUCTION AND REMARKS. The 1988 Annual Reservoir Control Center (RCC) meeting was held on 16 and 17 November 1988, in the Southwestern Division (SWD) office, Dallas, Texas. Mr. Charles Sullivan, Chief of the RCC started the meeting by asking each attendee to introduce themselves, to include the number of years involved in Reservoir Control. The agenda and attendance list are enclosed as attachments 1 and 2, respectively.

II. DISTRICT STATUS REPORTS.

a. TULSA DISTRICT. Mr. Ross Copley reported flows on the Arkansas River were moderate at the start of this year, but became progressively dry with time. Unable to provide water to sustain flows for navigation tapers. The first navigation emergency was declared by the Division Commander. The declaration allowed the use of some conservation storage in Kaw, Keystone, Oologah, Hulah, Copan, Tenkiller, and Eufaula to provide flows to keep the navigation system open until maintenance dredging could be completed.

Flows in the Red River Basin ranged from 140 percent of normal in the upper basin to about 50 percent of normal below Lake Texoma. No major floods occurred; but, did experience some isolated events. These isolated floods resulted in high pool levels in Hugo and Broken Bow Lakes. McGee Creek Reservoir (Section 7 project) filled for the first time in February 88.

Significant progress was made on the development of water control manuals for Keystone and Toronto Lakes. First draft Drought Contingency Plans (DCP) were submitted for priority river basins in September. The District plans to contract out works on several future DCPs. Funds for contract work are currently available. Also, the District plans to contract some work on water control manuals.

Mr. Carroll Scoggins also reported for the Tulsa District. His discussion centered on benefits that can be gained from major flood events. The October 1986 flooding in the Arkansas River has enabled the District to obtain funds to purchase additional hydrologic equipment, improve stream gaging equipment, i.e., replace gages on bridges with gages at higher ground locations, install DCPs, install staff gages, rain gages, etc., at critical station locations. Also, provided funds to have USGS to extend rating curves to include higher flows. Carroll showed slides of some of the equipment which has been installed at key stations.

b. FORT WORTH DISTRICT. The District installed 12 gages in

the Upper Trinity River Basin for model tests and development. The network is working well as reported by Mr. Arnold Escobar. Seven of the 24 projects were visited by Water Management personnel during the year. More projects will be visited after the Reservoir Control section is realigned. The realignment will provide for more project regulators; therefore, more personnel for project visitation. Fourteen out of the District's 24 projects stored water in their flood pools. However, by mid-May many parts of the state of Texas were experiencing well below normal rainfall and by the end of September the annual rainfall ranged from 68 percent of normal in the eastern part of the state to about 75 percent of normal in the Panhandle. In July the District began Drought Contingency Plan Development for their projects on a basin or sub-basin concept. The plans are scheduled to be completed in 1990.

Mr. Escobar reported that the non-Federal hydropower activities for the past year consisted of the following:

- On 18 Nov 87, Canyon Lake was lowered eight feet below the conservation pool and the gates closed in order that relining of the flood control conduit could be started. In Sep 88 the District inspected the hydropower facility and the pressurization testing of the conduit and bypass system is scheduled for Oct and Nov 1988.

- Construction of the non-Federal facility at Town Bluff Dam continued during the past year and the completion date is scheduled in April 1989.

- License applications are under review for Lewisville, Ray Roberts, Wright Patman, and Lake O' The Pines.

Water quality reports for 15 of the 24 projects have been prepared and submitted to SWD. These studies have not surfaced any major water quality problems. Completed sediment resurvey report in Oct 88 for Stillhouse Hollow. No funding for sediment surveys for FY 89. FY 88 flood damages prevented by Corps projects exceded \$6 million. Arnold stated that the Ground Receive Station (GRS) equipment was transferred to the USGS in Sep 88. The transfer is a part of the memorandum of Agreement between the Corps and the USGS for the USGS to provide operation and maintenance for the GRS. In July 88, sixteen employees took a course titled "Flood Forecasting: which was presented by HEC personnel. Contract work during the year included the completion of modeling for Brazos and Trinity River Basins by the SWT. Through an A-E contract portions of water control manuals were completed for Navarro Mills, Bardwell, and the Trinity River Basin master manuals. Arnold concluded his report by sharing information with the group concerning the project manager's capability to remotely operate the flood gates at Georgetown Lake. This raised concerns for the security of such operations, i.e., access to the controls by unauthorized personnel. Questions were also asked as to whether engineering had been involved in making such decisions. Dick Kreiner of the

Albuquerque District stated that their Abiqui project had been automated; however, the automation equipment has been abandoned due to the technical requirements for maintaining the operations. Mr. Sullivan requested that each District investigate activities concerning the automation of flood gate operation and provide feedback through their Branch Chiefs to SWDO.

c. LITTLE ROCK DISTRICT. Mr. Jim Proctor reported for the Little Rock District. He said the District experienced extreme conditions during the year, above normal rainfall in the early winter months and below average amounts during most of the summer months. Drought conditions were experienced in the spring and summer months; however, overall conditions were not as severe as published. Problems were experienced in navigation due to low flows on the Mississippi River and large volumes of material were dredged in order to maintain navigation depths. Had as many as 5 dredges working in the 10 mile entrance channel at one time during the summer.

The District requested 27 deviations during the past year. These deviations were required for shoaling problems along the Arkansas, hydropower, recreation, assist upstream District, project maintenance, fisheries, farming and drowning. Other items of interest include:

- Beaver Dam cut-off wall for seepage control. Bids are being taken with the target to begin construction in April 1989.

- Clearwater seepage control and spillway widening with a parapet wall across dam. Construction is approximately 60 percent complete.

- White River entrance channel problems. Possible solution is to construct an additional L&D near the mouth to overcome low stages on the Mississippi. A justification report is scheduled to be submitted to higher authority in September 1990.

- Non-Federal hydropower. Construction of power plants at L&D No. 13 and L&D No. 7 is nearing completion. Experiencing good coordination with L&D No. 13; however, not true at L&D No. 7. Jim recommends that these plants be automated so that the District can get data on a real-time basis.

d. GALVESTON DISTRICT. The District experienced dry conditions for the entire year without flow into Addicks and Barker reservoirs as reported by Mr. Charles Scheffler. There were no sediment or water quality activities during the past year because of the dry conditions. Hurricane Gilbert did not produce the rainfall as expected. However, the District went into emergency operations where most of Corps personnel were evacuated. No problems with the USGS maintenance contract for maintaining data collection platforms (DCP). Some stations were vandalized. Work was continued on the hydrologic network, i.e., installation of DCPs.

e. ALBUQUERQUE DISTRICT. Mr. Dick Kreiner reported eleven projects were visited by reservoir regulation personnel. Watersheds within the District received well below normal snowmelt runoff.

Construction of the Abiquiu non-Federal hydropower project continued in 1988. The flood control conduit was closed from Dec 87 through Feb 88 to allow for the installation of a steel liner in the conduit. While the liner was being installed, 50 cfs was pumped over the dam to meet downstream needs. The Plenum chamber installation will start in mid-Nov 88 and continue through Feb 89. The Bureau of Reclamation tested the automatic operation of the spillway gates at Sumner Dam (Section 7) where the reservoir regulation personnel participated. The gates open automatically when 60 percent of the flood storage is utilized which result in large increased releases. The test showed that the gates open very rapidly; therefore, every effort will be made to limit the pool elevation from this range. On 6 Sep 88 the Bureau began initial filling of the newly completed Brantley Dam (Section 7). The primary purpose of the dam is for dam safety. Dam safety evaluations for McMillan and Avalon dams showed that they had inadequate spillway capacities. The old McMillan dam will be contained within the reservoir area of Prantley and the dam will be breached in 1989. Avalon is below Brantley and will be used primarily as a diversion structure.

The Rio Grande reevaluation study was started during the past year. The 2-year study, as authorized by Congress, directed the Corps to take the lead in evaluating the operation of Federal reservoirs in the Rio Grande basin above Ft. Quitman, Texas. The study will identify opportunities to provide flood protection and additional beneficial use of available water. The final report is scheduled for completion in FY 89.

III. SOUTHWESTERN DIVISION LAB. WATER QUALITY ANALYSES. Mr. William Tanner, Director of the Lab briefed the group on functions and activities of the Lab, i.e., testing of soils, concrete, environmental, etc. He stated, however, his specific reason for attending the meeting was to solicit help in the area of water quality testing. Would like to have the Districts to have their water quality testing done through the Lab. Mr. Tanner explained that they were equipped to do the analyses and could do them at competitive prices. At this point he introduced Ms. Cathy Hutchins. Chief of the Environmental Section. She reiterated the Lab's capability of providing service in water quality testing. The Lab is capable of doing all metal tests in-house with some work being contracted out. Also, has storage capacity with the necessary equipment to do the complete analyses. Also, can do BOD, but, recommends that these analyses be done on site. At the end of the presentation. Mr. Sullivan encouraged the District representatives to consider using the Lab if costs are competitive and if same results are the same as current analyses. Mr. Tanner added that costs are negotiable.

IV. NEXRAD UPDATE. NEXRAD is the next generation of radar systems as stated by Mr. Clinton Word. The system is fully automated. The first stage of development will not include all features, such as precipitation stations. The second stage which is expected to be complete in early 1989 will include precipitation stations. Water control activities should be enhanced by the use of NEXRAD because of its ability to measure spatially and it provides ground truth of rainfall. Precipitation measurements will be received every 5 minutes and volumes every hour. Currently the accuracy of the system is being questioned; however, the system has great potential especially with the ongoing development. In order to make the system work, support is needed from all. In closing, Mr. Word stated that a prototype should be up within the next year. Mr. Carroll Scoggins continued the discussion on the NEXRAD by reinforcing the need for support of the system. He said support is being sought through states, universities, etc. At this point, support is good. The District's data collection platforms (DCP) are expected to be included in the Rainfall Network. Need HEC and WES types involved to assist in developing both hardware and software. The Air Weather Service is the key element in design of the system and solicits the Corps' involvement. Carroll also requested the SWDO to emphasize the system to HEC so that they may get involved in developing software.

V. BACK-UP PROCEDURES-WATER CONTROL DATA SYSTEM.

a. General: Mr. John Parks began his discussion by defining the WCDS and stressed it did not only consist of a computer but consists of other key elements, i.e., DCPs, software, etc. John commended the group for their input into developing the system. The SWDO WCDS is equal to any system in the country; however, we need to stay on top of things to stay ahead.

b. COOP Status:

(1) System Plan - Complete

(a) Data Acquisition Procedures - was not included in plan, but is needed for back-up system.

(b) Data Base and Software - the data base is to handle all data within SWD; however, all of the software is not complete.

(c) Equipment - Complete except for the Albuquerque and Galveston Districts.

(2) Local Plans (Appendix to Plan) - Local plans should consist of notification procedures, procedures for bringing the system up and procedures for relocating.

c. Implementation and Testing of COOP - The plan has not been tested. At this point, a test is expected to surface some holes in the system.

At the end of John's presentation, a general discussion took place concerning the use of data bases (DSS vs Total). After lengthy debates and no agreement as to what data base would be used in SWDO, and without an agreement on data base selection, SWDO requested that the COOP plan be revised to reflect the preferred data base.

VI. WATER CONTROL MANUALS AND SCHEDULES. Mr. Charles Sullivan said this year's request for manual schedules asked for more details than in past years. SWDO will be doing a more thorough review of schedules and will provide each District feedback on their schedules. Projection for manual schedules has been extended from three years to five years. The Chief of Engineering Division, SWDO, places water control manual development as second highest priority in SWDO.

VII. SWDO (DALLAS SITE) DATA BASE DEFICIENCY. Mr. John Parks gave a brief summary of deficiencies of Dallas site in the following areas:

- a. Goes Data Retrieval - back-up system.
- b. Pertinent Data Files - Need updating by districts. A tool to do the updating is a program names "PERT", which extracts pertinent data from data base.
- c. Maintenance of the MCF Files - currently being updated by SWDO.
- d. Error Checking - Set extreme units in MCF to kick out obvious bad data; however, this procedure will not eliminate all errors.

VIII. WATER MANAGEMENT BUDGET. From a series of slides and handouts, Mr. John Parks discussed some of the past year's budgeting activities. A serious error was made during the budget review, Engineering at SWDO was not given the opportunity for budget review. Consequently, SWD-ED was unable to defend activities related to water control. It is necessary that SWD-ED be represented to answer questions concerning level of funding of water control manuals, i.e., plan development may be in levels 1 and 2, but manual documentation is in a lower level.

IX. DROUGHT CONTINGENCY PLAN DEVELOPMENT. Mr. Ralph Garland gave an update on plan development. The 18 and 19 October 1988, meeting allowed for ajoint review of first draft DCPs along with concurrent review of the "SWD Framework". The DCPs were reviewed mainly for consistency in format and content. Upon completion of DCP reviews, it became obvious that major inconsistencies existed from District to District even between reports developed within the same District. Therefore, the committee made the decision to revise the framework in order to achieve the consistency in all reports. Revisions consisted of:

- Standardizing the table of content.
- Standardizing paragraph 1 "Purpose of Document".
- Require the use of drought severity index as published by NOAA/USDA.

- Editorial changes throughout the framework. The framework would be revised by SWDO with above changes and provided to the Districts for continuing development of their DCPs.

X. AFOS DATA EXCHANGE. Mr. John Parks stated that the VUENWS current capabilities include graphics enhancements that have been made over the last two years. Nineteen to 20 products have been selected for use; however, there are still some problems with the RFC in Tulsa, OK. The product index file should contain the same products for all sites. The Dallas site file has been completed.

XI. WATER CONTROL PC FIELD GROUP MEETING. The purpose of the meeting was to discuss the life of the Harris system as stated by Mr. John Parks. The expected life of the system is through 1992. Majority of the discussions centered around the pros and cons of the Harris system, i.e., if the system is small then PCs would be adequate; however, if a large system, then will need something larger. One of the concerns for the Harris is because of Harris' nonsupport for the existing systems. Some of the recommendations were to have a system of PCS or the Unix. No solutions were arrived at this meeting. The next meeting agenda will contain an item to analyze the Corps wide contract to determine its needs and also analyze its communications network.

XII. NESDIS DCS AUTOMATIC PROCESSING SYSTEM (DAPS). Mr. John Parks stated that the current status of the system is that the NEDIS has a contract to update the system. The updated system should be in place by July 1989. Enhancements to the system by the Corps are: (i) GOES demodulators have been deleted and, (ii) DOMSAT will probably be used. John asked that each District should assure that they are receiving minutes of the TWG meetings. These are important because they contain current system changes.

XIII. OTHER TOPICS. Mr. Charles Sullivan reported on these topics:

a. Ground Receive Station (GRS). The back-up to the GRS should be in place as soon as possible. It should take about 3-1/2 weeks to do the software. The Fort Worth District is expected to provide a person to SWDO to complete the job.

b. Meteorologist Position in SWDO Water Management Branch - Mr. Sullivan informed the group as to when the person would be entering on duty and discussed some of the job duties. He asked for suggestions as to what jobs the meteorologist could do for the Districts. NEXRAD will be one of the major duties.

c. Harris Support for Total Database - Harris' support will be through March 1993. The cost for the maintenance is questionable at this time; however, his feelings are that we will not have to pay for the maintenance.

XIV. SUMMARY. The following is a list of items discussed by the group in closing the meeting:

- Why not have the annual RCC meeting in District offices? The Albuquerque District is recommended for the next year's meeting place. Some of the advantages of having the meeting in the District are involvement of District staff, see projects that may have interest to all, etc.

- Task group for the COOP plan should meet and make necessary revisions within the next two weeks.

AGENDA
1988 RCC ANNUAL MEETING
SOUTHWESTERN DIVISION
CORPS OF ENGINEERS

16-17 NOV 88

1st Day

1000

- I. INTRODUCTION & REMARKS
- II. DISTRICT STATUS REPORT
- III. SOUTHWESTERN DIVISION LAB, WATER QUALITY ANALYSES
- IV. NEXRAD UPDATE
- V. BACK-UP PROCEDURES - WATER CONTROL DATA SYSTEM
 - A. GENERAL
 - B. COOP STATUS:
 - 1. SYSTEM PLAN
 - a. DATA ACQUISITION PROCEDURES
 - b. DATA BASE AND SOFTWARE
 - c. EQUIPMENT
 - 2. LOCAL PLANS (APPENDIX TO SYSTEM PLAN)
 - C. IMPLEMENTATION AND TESTING OF COOP
- VI. WATER CONTROL MANUALS AND SCHEDULES.
- VII. SWDO (DALLAS SITE) DATA BASE DEFICIENCY
- VIII. WATER MANAGEMENT BUDGET

AGENDA
1988 RCC ANNUAL MEETING
16-17 NOV 88

2ND DAY

0800

- IX. DROUGHT CONTINGENCY PLAN DEVELOPMENT
- X. AFOS DATA EXCHANGE
 - A. VUENWS - CURRENT CAPABILITIES, GRAPHICS
 - B. PRODUCT LIST, INDEX AT ALL SITES
- XI. WATER CONTROL FC FIELD GROUP MEETING (19-20 OCT 88)
 - A. PURPOSE
 - B. RESULTS
- XII. NESDIS DCS AUTOMATIC PROCESSING SYSTEM (DAPS)
 - A. CURRENT STATUS
 - B. ENHANCEMENTS TO GOES DCS BY CORPS
 - 1. GOES DEMODULATORS
 - 2. SATELLITE DATA DISTRIBUTION SYSTEM (DOMSAT)
 - C. DAPS PLATFORM DATA TABLE (DPT)
- XIII. OTHER TOPICS
 - A. GRS TRANSFER TO USGS
 - B. METEOROLOGIST POSITION IN SWDO WATER MANAGEMENT BRANCH
 - C. HARRIS SUPPORT FOR TOTAL DATABASE
 - D. INSTALL NEW OPERATING SYSTEM ON HARRIS
 - 1. SCHEDULE
 - 2. NEED FOR COORDINATED INSTALLATION
- XIV. ADJOURN

1988 RCC ANNUAL MEETING
Southwestern Division
U.S. Army Corps of Engineers

16-17 November 1988

ATTENDANCE LIST

<u>NAME</u>	<u>ORGANIZATION</u>
Ralph Garland	CESWD-ED-WF
John E. Parks	CESWD-ED-WF
Jim Barton	CESWI-ED-HR
Loren Pope	CESWI-ED-H
Charles Scheffler, Jr.	CESWG-ED-H
Douglas Perrin	CESWF-ED-HH
Elgie Henderson	CESWF-ED-HH
Cliff Victor	CESWF-ED-HH
Clinton Ward	CESWI-ED-H
Ross Copley	CESWI-ED-HR
James A. Proctor	CESWI-ED-HH
Arnold Escobar	CESWF-ED-HH
Frank Jaramillo	CESWA-ED-PH
Carroll Scoggins	CESWI-ED-H
Dick Kreiner	CESWA-ED-PH
Don Gallegos	CESWA-ED-PH
Charles Sullivan	CESWD-ED-WF
Paul Rodman	CESWF-ED-HH (Part-time)
Min Rokich	DAD (Part-time)
William Tanner	CESWD-ED-GL (Part-time)
Jim Medlock	CESWF-ED-HH (Part-time)

MINUTES

Arkansas River Basin Coordinating Committee Meeting
1114 Commerce Street, Dallas, Texas
6 June 1988

1. The Arkansas River Basin Coordinating Committee meeting was held in the Southwestern Division office, Corps of Engineers, Dallas, Texas on 6 June 1988. A copy of the agenda is attached as enclosure 1. The meeting was attended by 55 people, which included 16 of 22 Committee members and 39 invited guests. A copy of the attendance list is attached as enclosure 2.
2. Brigadier General Robert C. Lee, Division Engineer, Southwestern Division, Corps of Engineers, and chairman of the committee, opened the meeting at 10:00 o'clock a.m., welcomed the group to the 2nd meeting of the reconstituted Arkansas River Basin Coordinating Committee, and introduced the attendees.

He briefly reviewed the background that led to the formation of the original Arkansas River Basin Coordinating Committee and the reconstitution of the present committee consisting of state and federal representatives concerned with the many uses within the basin. He pointed out that the committee serves as an advisory committee to the Corps of Engineers in the development of operating plans for the System. A copy of the opening remarks is attached as enclosure 3.

BG Lee stated that the purpose of the meeting and the report were displayed on the screen (see enclosure 4 for a copy of the screen display).

3. David Burrough, Chief, Planning Division, Little Rock District presented a review of the Arkansas River Basin, AR and OK, Feasibility Study, Operational Plans Review Draft Report, which is sponsored through the joint efforts of the states of Oklahoma and Arkansas and the Corps of Engineers. A copy of Mr Burrough's presentation is attached as enclosure 5.
4. Mr. Ross Copley, Chief, Reservoir Control Section, Tulsa District Corps of Engineers presented a review of the 1987 through spring 1988 operations in the Arkansas River Basin System above Ft. Smith Arkansas. A copy of Mr Copley's presentation is attached as enclosure 6.
5. Mr. Bob Schroeder, of the Reservoir Control Center, Little Rock District presented a review of the 1987 through spring 1988 operations in the Arkansas Basin below Ft. Smith, AR. A copy of Mr Schroeder's presentation is attached as enclosure 7.
6. Following these presentations, committee members were given the opportunity to address the group. Those committee members present made remarks appropriate to their areas of interest and

expertise. A summary of these remarks are as follows:

a. Ed Lindsey, Southwestern Power Administration stated that he supports Plan C, with reservation and thinks the taper should stop at the top of conservation pool. He thinks the study should consider the use of noncontracted storage in non-power reservoirs first. The reallocation of uncontracted storage should also be considered. He thinks water may be needed for possible drought conditions.

b. Chuck Thomas, Oklahoma Soil Conservation Service, stated that plan C appears to approach a reasonable balance. However, other alternatives should be pursued in the feasibility report.

c. Bob Price, Ark Soil Conservation Service, said the use of the Arkansas River water for irrigation should be studied, and that we should look at the high salt content. He also presented a brief report on the Arkansas Valley Irrigation Project and the Plumb Bayou Watershed Irrigation Project. This report is attached as enclosure 8.

d. Ed Thompson, Ark-Okla Port Operators Association stated that he favors Plan C.

e. Dr. Jan Dean, Oklahoma Fish & Wildlife Commission, stated said he was representing Steve Lewis who had other commitments. He said the Operational Plans report underestimates fish & wildlife recreation losses. The methodology used was inadequate and they would like to work with us to use better methodology. There should also be more Oklahoma and U. S. Fish and Wildlife Conservation Commission input. They would like additional pool manipulations, i.e., higher for spring rises. A fishery decline during the next 2-3 years is expected due to the navigation emergency. A written report containing the official comments was submitted and is attached as enclosure 9.

f. Joel Wentz, Kansas Water Office, stated that Kansas reservoirs have little impact on the lower river. However, they are very critical for flood control.

g. Jim Barnett, Oklahoma Water Resources Board, said that more concerns need to be addressed in the final report, i.e., refinement of the method of estimating dredging costs, improve estimating of recreation impacts. Also a better method of estimating the archaeological impacts and shore erosion impacts is needed. A written statement was submitted and is attached as enclosure 10.

h. Randy Young, Ark Soil & Water Conservation. Commission, stated that plan C is good to maximize benefits and maximize competing uses. The Fine Tuning Plan is a positive step and the Corps efforts to maximize coordination with the state is appreciated. He said water supply use will increase in Arkansas and more control of runoff must be exercised to benefit the basin as a whole. A written summary of comments was submitted and is

attached as enclosure 11.

i. Harvey Bollinger, RedArk Development Authority, said the draft report is a good first step. However, he is concerned that we are emphasizing plans A, B & C. He said that we must focus on other alternatives, including modifications to improve the system. He said we must be consistent in evaluation among purposes and in applications of authority. Also the plan needs to deal with too little water, not just too much water.

j. Glen Cheatham, Oklahoma Department of Commerce stated support of the use of Plan C until we have better plan. He supports the attempts to improve the reliability of the system and to assure that all purposes are served, not just navigation.

k. Jim Phillips, Arkansas Waterways Commission, commended the work done and supports Plan C. He would like to see development of plans D, E, F giving 310, 320, 340, or even 365 navigation days. Perhaps this is not possible, but we should strive for that. Need to recognize that 75,000 cfs at Van Buren is too high. A flow of 65,000 cfs at Van Buren, not 75,000 cfs, is needed because the flow increases by 10,000 cfs more when it reaches the end of the system.

l. John Pearson, Port of Catoosa, indicated that he supports plan C. He said that more navigation days are needed but recognizes the multi-purpose use of the system. The existence of the group is a good tool where all interests can be heard.

7. Mr. Estus Walker, Chief, Water Management Branch, Southwestern Division, Corps of Engineers, presented a brief review of the conditions which made the recent declaration of a navigation emergency necessary. A copy of Mr. Walker's presentation is attached as enclosure 12.

8. A copy of the Corps legal opinion furnished to GAO in response to GAO legal questions incident to the evaluation of the "Corps of Engineers Operating Plan for the Arkansas River Basin" was made available at the meeting. A copy is also attached as enclosure 13.

9. Conclusions.

a. Brigadier General Lee stated that the advice of the committee is greatly appreciated and that we should move ahead from where we are to finish the feasibility study. He told the members to feel free to contact him any time.

b. The next meeting was tentatively set for early May 1989.

10. Meeting Adjourned at 3:00 p.m.

** 13 Enclosures

1. Agenda
2. Attendance List
3. Opening Remarks - BG Robert C. Lee
4. Meeting & Report Purpose Slides
5. Arkansas River Basin, AR and OK, Feasibility Study Presentation - Mr. David Burrough
6. Tulsa District Presentation - Mr. Ross Copley
7. Little Rock District Presentation - Mr. Bob Schroeder
8. State of Arkansas Department of Agriculture, Activity Report - Mr Bob Price, Ark SCS
9. Written Comments - OK Department of Wildlife Conservation
10. " " - OK Water Resources Board
11. " " - AR Soil & Water Conservation Commission
12. Navigation Emergency Presentation - Mr. Estus Walker
13. Corps legal opinion in response to GAO

** NOTE - ENCLOSURES NOT PUBLISHED IN THIS REPORT